DEATH DEFERRED

BY

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HOW TO LIVE LONG AND
HAPPILY, DEFER DEATH,
AND LOSE ALL FEAR OF IT

PHILADELPHIA
THE PENN PUBLISHING COMPANY
1912

To
the memory of my
MOTHER

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Preface

ALTHOUGH there are a number of books dealing with the subjects discussed in the present volume —human longevity, and how to attain it—very few of them are compact and definite enough to provide much information of use to the average man or woman; they are not sufficiently practical and condensed. The busy man of to-day has not time to read through immense treatises on health and how to attain it, as did our forefathers; he requires his information sought out and classified for him; he wants the finished result; not the steps by which that result is obtained. It has been my object, in the present little book, to supply this need; to furnish a book which is at once practical, scientific, and concise; whilst the conclusions reached are only supported by as much argument as is necessary to justify and establish them.

In addition to the strictly practical side of the subject, however, I have added, here and there, several points of theoretical importance, which are of interest in themselves, and which cannot, I

imagine, fail to appeal to those who are interested in the broader fields of science and philosophy, and though I have restricted all such theoretical discussion to problems which bear more or less directly upon the subjects dealt with in the present book, my desire has been to deprive death of its terrors; and to prove that, no matter how we may choose to look at it, it should not be feared as it usually is.

I can only hope that many may find consolation in my pages.

In the Preface to our "Death: Its Causes and Phenomena," my colleague (J. R. Meader) and myself have said: ". . . But there is another side to this question, which must by no means be overlooked. We refer to the possibility of postponing death, on the one hand, and of rendering it more painless, on the other. Both of these results can be effected only by a thorough understanding of the process involved; and this, in turn, can only be obtained by a close, scientific study of the problem—one that includes all its aspects, and treats of them impartially. . . ." This we endeavored to do in that book, to which I would refer the reader for further details of this branch of the topic.

In this present book, my object has been to extend the knowledge already gained into a practical direction. I have endeavored to cover the two points indicated: the art of prolonging life and the art of postponing death. The subject of a painless death will also be found discussed in several extended passages in this book. I feel, therefore, that this small book supplements, in a practical and popular manner, our more detailed and theoretical discussion of death, published in a former and larger volume.

In conclusion, I wish to apologize for whatever shortcomings the book may contain. Books of this character must necessarily be defective, to some extent, in the eyes of others, who do not agree completely with the ideas expressed by the author, or who may not approve of the author's peculiar style. As to the ideas expressed and rules laid down, they are founded upon experience, wide reading and long study of the topics dealt with; and I am firmly convinced that they will be found to be of value to all who give them a fair trial. As to the manner of presentation—I merely wish to say that I have endeavored throughout to be clear and forceful in my expression, so that no misunderstanding may arise as to the meaning I

wish to convey. Personally, I admire *vitality* and unmistakable *candor* in a book more than beauty of style, under which is too often concealed ambiguity of thought; and nothing is (to me) more annoying than to read a book which is so carefully worded and so guarded in its tone that, after reading it, one cannot be sure of the author's conclusions! That is a fault which I have endeavored to avoid, above all others, in my writings on this and other subjects; and, though other defects may be present, I hope and believe that *this* charge—of ambiguity of style, or lack of conviction—cannot be charged against me –here or elsewhere. If I have succeeded in clearly formulating the laws of life and health, and thus helping others to live the "life more abounding," I shall feel amply repaid.

H. C.

DEATH DEFERRED

CHAPTER I

LIFE AND DEATH

THREE great problems always confronted the primitive mind: the nature of the figures seen in dreams; the fate of the individual soul after death, and the difference between living and lifeless bodies. Modern science has been enabled to answer the first of these problems in a more or less satisfactory manner, and contends that the figures seen in dreams (at least the majority of them) are mere mental memory-pictures, of a hallucinatory character, just as are the figures seen in a feverish dream. But as to the second question, and the third, we are nowadays as little enabled to answer them as were the most primitive savages. Whilst the belief in the survival of a soul is almost universal, as we know, yet each religious creed has a different idea as to its character and destiny,—Spiritualists and The-

osophists holding very different views from most of the Orthodox religionists of the present day; while in all ages of the world's history, varying beliefs have existed on this great question. As to the *third* problem which confronted the primitive man—the difference between the living and the lifeless body—science is totally unable as yet to give any *decisive* answer; it remains for us as for them the problem of all problems—the mystery of the universe, the secret of being. One moment we see a figure before us—a muscular, virile man, capable of heroic efforts, great intellectual flights, lofty aspirations, delivering an oration which stirs the hearts of thousands, and, perhaps, helps to sway the destinies of nations, and change the map of the world! The next moment, he is lying on the floor a corpse—lifeless, inanimate, incapable of the simplest thought, the slightest muscular exertion. He is the victim of "heart-failure." A second, and all has changed. Nothing can now be influenced by him; nothing is now possible, but the gradual decomposition of the body, and its return to the dust whence it sprang. Could any change be more profound or more lasting—since it can occur presumably but once in all eternity? The slightest anatomical variation

in the man's body—so small, perhaps, that even a microscope cannot detect it—and we then behold the most mighty change which occurs in nature—the profoundest of tragedies and of wonders! We behold the transition from the living to the lifeless! We pass from life to death! What is this change we have seen before us? Can we in any way understand it? What can be life? what death? These are questions over which men have pondered for centuries, and still form the most fascinating problems in the realm of scientific inquiry.

Death is Universal

The subject of death has exerted a powerful influence over men's minds from the earliest times. Always speculations were indulged in as to the origin and nature of *death*, as of the origin and nature of *life;* for the phenomenon is the most striking as well as the most awful event which can occur. It is probably as old as life itself; yet (like love) is ever new to the one who experiences it. Death is everywhere present in the world. Each autumn we see the trees and the grass, the flowers of the summer, the bees and insects die,—only to be replaced by others,

of equally new and beautiful hues, the succeeding spring. A cycle of life follows upon that of death. Ever changing, ever new; we see the eternal fulfilment of the great law—that out of death is evolved life, and out of life, death. The caterpillar enters its cocoon, which it has spun at great toil, and later emerges as a beautiful butterfly—the symbol of immortality. Similarly, it has been urged, we spin our own cocoons here in life, in which we go to sleep; then we die—only to awaken in another world as more beautiful and radiant creatures than we are here. And just as there are good and loving attendants to see to our needs, when we enter this life, so—it has been argued—there will assuredly be loving and tender guides, when we have passed through "the valley of the shadow of death," to greet us upon the "other side."

A Boon or a Curse

However this may be, the *fact* of death remains—terrible for the survivors, as a rule, if not for him who suffers it. It has a terrible side, but also a hopeful aspect, as we shall see later. Death may be a skeleton in black armor; it is also, perhaps, an angel of light in disguise.

It is not the purpose of this book, however, to discuss any of the religious or philosophical problems which surround death; but rather to keep close to fact, and to discuss principally the scientific and practical sides of the question. The particular aspect which is discussed at length is that presented in the battle against death, offered by modern medical science, and particularly by hygiene and rational methods of life. We all of us desire to live as long as possible; and the way to live long, to prolong life, is the question in dispute. Some advocate one régime; others another. In the present volume, I advance my own conclusions, reached only after a careful study of the problem in all its aspects for a number of years, and after considering the many theories which have been advanced in the past. I have endeavored to summarize, or at least briefly refer to, practically all this material which is of importance, and draw the practical conclusions which can be drawn from the evidence presented. After this, I have advanced certain theories of my own.

It has been said that "it is given to every man once to die"; but while this may be true, we naturally desire to live as long as possible and to

meet death not only prepared, but to insure for ourselves as painless a death as possible, and one that is not premature. *This can certainly be assured in the majority of cases*,—were the simple rules and dictates of nature followed; and it is the object of this book to indicate, as briefly as may be, the various laws that must be obeyed in order to insure natural and worthy climax to a happy and healthy life. Death may assuredly be made quiet and painless; it may be postponed for many years; and, when it *does* come, it may be rather welcomed than the reverse—just as we welcome sleep at the end of a long, hard day's rest—if it is natural and not premature. This may all be assured: it can certainly be acquired. If the simple rules which follow be observed, there is no known reason why any one should die prematurely; and, when he *does* die, why his death should be anything but painless—"a falling asleep, as on a bed of roses, to awaken again in a land which knows neither pain nor sorrow." And meanwhile life can be made happy and joyful so long as it lasts.

Why Not Discuss It?

I see no reason why these subjects should not

be studied and discussed just as well as any others. There seems to be an idea that "death" is a subject to be "tabooed" by polite society; something to be spoken of with bated breath,—if at all. But there is no valid reason why this should be so. Let us discuss the subject from the scientific point of view, just as we discuss any other question; and we shall see that it can be made to assume tremendous interest, as well as practical value, to mankind.

Death Defined

At the present day, science is unable to give an exact definition of death—many as have been attempted in the past.[1] It has been generally de-

[1] When we speak of death, what do we mean? Does a flower die when it is picked? Does a chicken die when its head is chopped off? Do all the bodily cells die at the same time? There are various kinds of death; the word may be defined in several ways; and we must be sure we understand just what we mean.

With beings possessing a centralized nervous system, consciousness is doubtless obliterated at the moment when it is irretrievably shattered, as, for example, when the animal's head is cut off. Its "conscious" life ends then. Next, we have what is called the "somatic" life, or life of the body—its general life. This also terminates at the moment when the creature's head is amputated. Finally, we have the cell-life, or the resident life

fined as "the cessation of life," or "of the life processes," but as life is not yet adequately understood, it will be apparent that this simply answers one question by asking another. We can easily see that if we understood life we could define death as its cessation, but when we do not know what life is, here comes a difficulty! Let us first of all, however, consider life, and see if we can better understand its nature, before we pass on to our discussion of death and its cognate phenomena.

Inanimate matter is said to be "dead"; and

remaining in each cell individually; and this is not terminated at death,—not until a considerable time later. Cells may live on for several days after general death has taken place. This remaining vitality may cause the hair, the nails, etc., to grow after death—thus giving rise to the idea that the individual was not really dead at the time of his burial. But this does not prove that he was still living. Cell-life continues, when general life has ceased.

This connection of the life of the body has given rise to much speculation. Is the general life of the body dependent upon the sum-total of the cell-life? Is it independent of them? Are they somehow intimately connected and interwoven? These are puzzling questions in biology of which there is much to be said not suitable to a general work of this character. Those who may be interested in this field of research will find such questions very fully treated in "Life and Death," by Prof. A. Dastre; and "Death: Its Causes and Phenomena," by the present writer and Mr. J. R. Meader.

living matter is said to be "living," and the presence of "life" constitutes the difference between the two. We come, therefore, to the threefold problem of life: viz., its origin, its nature, and its termination,—this latter being death, as we understand it. First, then, as to its origin.

The Origin of Life

We are quite unable to comprehend how life originated on this or any other planet. We can only repeat the old adage: "Life from life; no life without antecedent life." All life that we know came from similar life before it, by a species of reproduction. Certain it is that life must have been impossible at *one* period of the earth's existence,—since it was too hot to support it; equally certain is it that life flourishes upon it *now*, and almost equally certain are we that life will one day become extinct, as it is upon the moon, because the earth will have grown too cold to maintain it. We thus see death before and behind us; and a cycle of life in the middle, in which we are living. But how this life sprang into being is a mystery; and all the daring speculations, and all the experiments in the "creation of life" from inorganic matter have, so far, proved quite una-

vailing. Life *is;* that is all that we know as to its origin.

What is Life?

But if life "is," *what* is it? Here is another great unsolved problem. At the moment of conception, two minute bodies join together, and become one organic human being. Thenceforward, growth takes place by means of what is called cell-division;—one of the most interesting processes in nature. Each cell is composed of the body of the cell, the nucleus, and the inner body, called the nucleolus—the center within the center, in which many of the inner life processes are supposed to take place. The process of cell-division, as before said, is one of the most interesting imaginable. Lying beside the nucleus, there are two bodies, called "polar bodies," and these separate and descend to either side of the nucleus, until they lie opposite to one another. They are, as it were, the north and south poles; and this becomes more clear when each of these bodies sends out "lines of force," like two magnets, and pull the thread-like bodies in the cell apart, half toward one pole and half toward the other, until they are completely severed. The cell now

divides in two by fission across its center, and *two* new cells are thus formed, which in turn go through the same process of division, and so on indefinitely, until growth no longer takes place. All the above can be seen by means of a high-powered microscope.

Why Do We Die?

But there comes a time when the body *dies*, and cell multiplication no longer takes place. Death may be due to accident, to disease, or to a natural cause—death from old age, etc. We need not consider deaths due to accident and disease, since these are not essentially mysterious. Some organ or organs are so injured and maimed that life cannot utilize them for the purposes of manifestation; and this is true no matter what theory of life we may hold. But as to death from old age, so called "natural" death, that is another question! Why such deaths ever take place at all is a great puzzle to physiologists; and in many cases no reason can be found for their occurrence. There is a story of a famous physician, who was dissecting a corpse upon the table before his class. He proved to their entire satisfaction that every organ was perfectly sound and healthy; where-

upon one of the students asked the learned professor: "Why, then, did the patient die?" This was awkward for the famous physician, and he replied, in some confusion, that he did not know! In many cases this is so; and the reason for death in the animal world is not at all understood. It is not difficult to see why this should be the case.

In the first place, it is a wonder that, inasmuch as the human body is a machine which has somehow learned to repair itself, that it should ever wear out at all. The body does not wear out like any other machine, but every cell is constantly being replaced by new cells, and the body is in this way kept perpetually young. As Mr. Harry Gaze said, in discussing this very point:

"As natural activity does not wear away the body, but simply brings a change, so man is not made old by normal changes. . . . The centenarian and the little child are both continually building the body from equally new food and material. The mental conditions, however, are very different, and determine the great difference that is manifested. The centenarian thinks that his body is one hundred years old, while the child believes his body to be but a few years old.

Neither is correct. The human body cannot exist for centuries, or even for years. The body of the centenarian, which seems to be very old, in reality is new. . . . The fact that the body is incessantly changing demonstrates that old age is not caused by the passing of years, but by a lack of proper adjustment."

The Perfect Machine

That there is a considerable amount of truth in this is certain; and the idea that the body is ever *new*, while it may strike many as novel, is yet obviously correct. And, as before said, there is at present no *known* reason why man should die, provided he keeps his organs and his health "up to par." This is no wild statement, but one which has the best medical authority to fall back upon. Thus, Dr. William A. Hammond, the eminent neurologist, once said: "There is no physiological reason why man should die;" and Dr. Thomas J. Allen agrees, saying, "The human body is not like a machine which must wear out by constant disintegration, for it is self-renewing." G. H. Lewes, in his "Physiology of Common Life," said: "If the repair were always identical to the waste, never varying in the slightest degree, life

would then only be terminated by some accident, never by old age." And Dr. Munro asserted that: "The human body as a machine is perfect . . . it is apparently intended to go on forever."

Death a Mystery

These quotations will at all events show the reader that death is by no means so well understood as many suppose; and that, while it may ultimately be inevitable, yet may be largely postponed, if we but knew *how*. We are apt to take it too much for granted that a man must die at the age of seventy or so; the allotted "threescore years and ten," which is the goal of finality which many set for themselves, without ever stopping to ask the question whether this may not, after all, be indefinitely postponed, and a happy, useful life maintained for many years longer? From the above quotations we see that life can be protracted, theoretically, a very great length of time; and one wonders why it is not so practically. If the human body can maintain and preserve its existence for many years longer, why does it not do so in point of fact? Theory and practice do not seem to agree. But there must be some reason for this. If we understood the processes which

aged the body, might we not, by offsetting them, lengthen our days and add greatly to its comforts and enjoyment? Assuredly we should; and the reason there is so much suffering in the world; the reason why so many deaths take place prematurely, why there is so much sickness and disease and misery, is that these laws of life are *not* understood; they are *not* followed, and, consequently, life is cut short much before its allotted time. In other words, nearly all the deaths which take place, and which we are accustomed to regard as "normal" or "natural," or due to "old age," are not such in reality; *they are premature*, and result from transgressions of nature's laws. And this may be proved in several ways.

How Long Should We Live?

In the first place, it is known that throughout the animal world (with the exception of man) a mammal lives about five times as long as it takes to arrive at maturity. Thus, a dog matures at about two years of age, and dies at about ten, etc. The same law holds good throughout a large part of the animal world. It should hold good for man also. As man matures at (say) twenty, he should live to be at least a hundred before he dies—and

this without showing any signs of old age, or mental or physical decrepitude. This *should* be the rule, instead of the exception. But instead of this, we find that the average length of human life is a little more than forty-two years; and that one-fifth of the human race dies before it reaches the age of two years! Surely such a state of affairs cannot be considered natural? It is rather an indication that *something* is wrong; which, if rectified, would prevent such a condition and would greatly lengthen human life.

Natural Death Painless

In the second place, if death were really natural, it would be practically painless, and would not be so terrible a thing as it often is. Natural deaths are painless. It is only when they are due to disease that pain is experienced, and the patient finds it hard to die. In death from old age, no pain is experienced. Nature has a wonderful mechanism for this. When the time to die arrives, the breathing becomes more and more shallow; a lessened supply of oxygen is given to the lungs; and the result is that a gradually increasing supply of carbon-dioxide gas finds its way into the circulation, deadening and poisoning the

nerve-cells throughout the body. This acts as an anæsthetic; and the result is that we are gently and quietly rocked to sleep,—without pain, and without knowledge of the fact, that we are really dying at all. So we see that pain is impossible in a really normal death—one due to old age, as all deaths should be. If it be present, it is evident that the death is premature, and could have been prevented, had proper measures been taken in due time.

When Death is Desired

In the third place, natural death, if truly natural, may be desired, just as it is usually feared and dreaded in the majority of cases. Metchnikoff was the first to point out this fact, and for that he deserves due credit. We all know that when we are exhausted, as the result of a day's hard work, we are glad to sink to rest and to sleep; we do not fear losing consciousness, and sinking into oblivion; we rather rejoice in it. And it should be the same with natural death. It should be craved in very much the same way, and for the same reason. Having grown tired of life, we should long for rest and peace. Thus, death would lose its terrors, its fears and its pains. It would then become a natural instinct with us, just as sleep is,

when we are tired and sleepy. The fact that death *is not* looked upon in this manner by the majority of persons, and that they dread it so and dislike parting with the world, is proof positive that all such deaths are *premature.* We should not die when the desire to live is present. A little child does not think of death at all. As we grow to maturity, we think of it more and more seriously; but we still retain our grip of, and interest in, life. This is true even at seventy or eighty or ninety years of age. The reason is that, even at these great ages, as they seem to us, death is premature. *No deaths should take place before a hundred years of age.* If they do, they are in reality premature. And we should preserve our mental vigor and our physical health unimpaired up to that age. The fact that we do not do so, indicates, as before said, that something is wrong with our methods of life, and that, if these were corrected, premature deaths would not take place.

This being true, it becomes our duty to inquire into the causes of this premature old age and death, and see if we cannot prevent them, when once their causes are understood. To this practical side of the question we accordingly turn.

CHAPTER II

HOW TO PROLONG LIFE AND POSTPONE DEATH

In order to postpone death, it is only necessary to prolong life. This is a truism which many of my readers may deem too self-evident to need restatement, but its importance is so great that it will stand a certain amount of repetition. A healthy, happy life depends upon the degree of vitality in the body and the degree of health maintained. Freedom from disease should be our object, therefore—the effort to maintain as high a standard of energy as possible. Both depend, very largely, if not almost entirely, upon the extent to which we follow the dictates of Nature, and live according to her laws; for it has been proved over and over again that, if these laws are followed, health will result as a natural consequence. Generally speaking, it is impossible for a well man to become suddenly diseased. Nature does not work in that fashion. In order for disease to come about, a long period of living contrary to the laws of nature must have been

followed. It therefore becomes our duty to ascertain, as far as possible, what the laws of nature are in this respect, and then follow them as nearly as may be,—in our attempt to attain old age and freedom from disease.

The "laws of nature" in this respect doubtless exist, but we have some difficulty in finding them out. Like the animals, we may depend partly upon instinct, and in many cases our instincts are correct—though they can easily become perverted—in which case they are worse than none. But we must also be governed very largely by intelligence and knowledge; *science* must be our foothold here, if we are to know what we are about, and do ourselves no harm. We shall have something to say on both these points; but first let us consider the latter, leaving instinct, for the moment, for later discussion.

By means of anatomical examinations, we can observe the various bodily organs, and their relations to one another. Physiology tells us what their functions are, and chemistry tells us their organic composition. In this way, we are enabled to arrive at a knowledge of the chemical composition of the body, and hence tell just what foods are necessary—in order to repair and keep

the body in perfect preservation. The quantity and quality of food (and water) required may thus be determined. Then we know that fresh air is needed, at all times—this having been ascertained by means of direct observation. Similarly we know that a certain amount of bodily exercise is necessary, for without it good health is impossible. Then the great questions of heredity, environment, climate, clothing, mental influences, sleep, rest, relaxation, etc., must be taken into account. These have been discovered partly by direct means, viz., observing the effects of certain of these habits; partly by seeing their effects upon large bodies of people.

Observation and *experiment:* these are the two great methods of scientific inquiry at the present day. One we can control; the other we have to take very much as we find it. But of this I shall have something more to say presently.

Let us now consider, briefly, the various hygienic measures or methods which must be employed, in order to retain the best of health and a long life. We all desire a life free from disease of all kinds, and a long, happy and useful one. This can be acquired by all, as will be shown in the following pages.

Diet

Of all the factors which go to make health, the food factor is doubtless the most important, and for many reasons. Let us consider the following facts. Food, and only food, *makes blood*, —and blood, as we know, makes body; so that our bodily structure is dependent upon, and *only* upon, the food we eat. Breathing simply purifies that blood, or oxidizes it; exercise merely circulates it; but the food we eat is that which *makes* the blood, and in this respect food is certainly the most important factor that can possibly enter into the case from any point of view whatsoever.

It may be claimed that proper breathing will oxidize all food material ingested, turning it into healthy blood, even if that material be at the start not of the best, and that insufficient breathing and exercise may render the best food unsuited for the organism, for the reason that it is not properly utilized, and remains, as it were, always mal-assimilated. To a certain extent this may be very true, but it only emphasizes the point that breathing and exercise are, in a sense, *necessary*, not that they are *more* essential than the food which they oxidize and circulate! Pure

air cannot turn bad food into good blood. If the material used in the construction of a house be not of the best, no amount of careful plastering and no amount of ingenuity displayed by the contractors and builders can make that house as strong and as "normal," so to speak, as if the materials were in the first place of the best.

Moreover, breathing and exercise can never supply certain elements to the body, which, if lacking in the food, must be always lacking, and the body starve ultimately because of lack of these materials. Thus, in those cases where the food lacks certain salts, in organic compound, the body dies, as we know, of "saline starvation," and this would assuredly happen no matter how careful we were in breathing, or in exercise, or in mental attitude, or in any other manner whatever.

We must remember, also, that the food is the greatest producer of disease, and that its proper regulation, as to quality and quantity, is the greatest preventative measure, as well as curative measure, which we know. Why does the athlete always have to go into training for so long a period of time, and take so much exercise in his preparation for any contest requiring endurance?

It is simply because his body is in such a condition that this is required, in order to get rid of a lot of useless material which should never have been introduced in the first place. We constantly overeat, and then have to take enforced exercise in order to burn up, and get rid of, this excess of food-material! If we did not eat so much in the first place, all this would not be necessary. We should prevent the accumulation of this excess of mal-assimilated food material, and then the toxic or poisonous products which result because of its presence would be avoided.

Our Habits Are Wrong

Certain it is that "something is wrong somewhere" with the food habits of the people. As previously pointed out, while the average length of human life should be in the neighborhood of a hundred years, the actual length of life is about forty-two. Therefore, the average man cuts off more than half his life by reason of his modes of living; and more than that, these forty-two years are filled with all sorts of illnesses, and distressing diseases and complaints, for the relief of which he is constantly consulting the doctor. Yet it is generally acknowledged that if a man were in

good physical health, he could never get sick—but he virtually never is in good physical health! As the result of his habits of life, living contrary to the established laws of nature for a period of years, he brings upon himself all these complaints, and so creates disease, and cuts short his life by many years.

Inasmuch as this is the case, therefore, it behooves us to try and regulate our food supply in such a manner that like consequences do not befall us. What has been said before regarding experiment and observation will help us here.

Live on Simple Foods

If we could take a thousand people, and divide them up into two equal divisions—all of them being very much alike as to their state of health, temperament, etc.—and supply one-half of this number with food of a certain kind and quantity; and the other half with a different kind and quantity; and if one set of five hundred became, at times, ill and diseased; if they contracted colds, headaches and bilious attacks, and even more grievous sicknesses; and if, during the same period, the other five hundred remained practically free from all these complaints, then we

should assuredly be right in thinking that the first five hundred were not living as close to nature as the second; and that their food was wrong both in quality and quantity. We should also conclude that the second five hundred were far nearer the correct method of living than the first. Now let us apply these facts.

Were we to make such an experiment, it would be found that the five hundred who lived the most *simply* and the most *frugally* were those who preserved the best health, and maintained it the longest; and those who lived on an excess of rich foods were those who suffered from the various complaints. The lesson is obvious. *Live only on simple foods, and a limited amount of them, and good health will be the result.*[1]

It may be objected, of course, to this, that it is really impossible to make an experiment of this kind, and hence my statements are based on mere conjecture. But we do not have to make such experiments. All we have to do, in order to

[1] Condiments and spices of all kinds are to be avoided by one who desires to lead the truly hygienic life—salt, pepper, mustard, vinegar, cloves, spices of all kinds, etc., being included in the list. One can soon learn to do without them. We need salt, it is true; but it may be obtained in organic (usable) form in many fruits and vegetables.

prove this statement, is to keep our eyes open to what is going on all around us, and we shall see these very laws in active operation. Those who live in a certain manner suffer certain consequences, and those who live in another manner do not. The conclusions are inevitable.

But it is time we should leave mere generalizations, and descend to practical details. Granting all this to be true, *what* should we then eat? and *how much?* These are two separate questions, which require to be answered separately. First, as to the question of quality.

The Quality of Our Food

When the human body is chemically analyzed, it is found to consist of a number of elements, which can all be supplied by the following classes of foodstuffs, in varying proportions: (1) *proteid*, or muscle-forming elements; (2) *fats*, or fat and heat-forming elements; and (3) *carbohydrates* (starches, sugars, etc.), which are said to supply most of the heat and energy of the body. In addition to these essential elements, we must have *organic salts*, such as lime, iron, phosphorus, calcium, etc.; also *water* and *air*.

The more muscular work a man does, the more

proteid food he requires. That is certain. At the same time, it is now generally acknowledged that a man requires far *less* proteid than was formerly thought to be necessary, and that, as a matter of fact, excessive proteid consumption is the cause of many diseases and much trouble in later life. Professor Chittenden, of Yale, has proved, by a long series of experiments, that only about *one-third* as much proteid is necessary as the physiologists formerly thought was required. On this smaller ration man can be better, mentally, morally and physically, than on the larger allowance. Excess of proteid-containing food is very harmful, for, while starches and fats can easily be disposed of by the body, or get stored up as fat, an excess of proteid creates poisons, chief among which is uric acid, which creates rheumatism, and, by preventing exercise, etc., is one of the chief causes of premature old age and decay. Just *how* all this comes about is one of the most interesting problems in biology.

Why Does Not a Dog Perspire?

Have you ever noticed that your dog does not perspire? It never does (unless through its tongue, which lolls out of his mouth in the way

you see it during the hot weather). Neither does the cat, nor does any carnivorous animal. They all have sweat glands on their bodies, but they are inactive. They are not used. No carnivorous animal perspires. This is owing to a wise provision of nature, which prevents the skin from doing so. All carnivora have a great quantity of uric acid and other salts in solution in the blood. Now, if the volume of the blood be suddenly reduced, as by perspiration, it can readily be seen that the salts contained in the remaining ninety-eight per cent. must be deposited somewhere, owing to the lessened volume of fluid blood, and these salts are deposited in the joints, throughout the body. This is what happens when we perspire. We suddenly lose a considerable percentage of the fluidity of the blood, and the salts held in solution are naturally deposited throughout the body, causing aches and pains,—symptoms of rheumatism. But this is impossible in the carnivora. Nature has provided for that by stopping the action of their sweat glands. But in us this is not the case; we perspire. All this proves that we are not naturally intended to have a diet rich in proteid, and especially in meat; for if we do, we are sure to suffer in this and other

ways. We should be living contrary to the provision of nature.[1]

All the proteids which the body needs can be obtained from eggs, cheese, nuts, peas, beans, lentils and kindred foods, without resorting to great quantities of meat, to satisfy the bodily needs. Besides supplying the body with an excess of proteids, there are also many other reasons why we should not eat meat, of which the following are a few.

"A Poison Factory"

All meat contains, and must contain, a certain quantity of poisonous or toxic material in its very tissue. No matter how "good" or how "fresh" the meat may be, this is inevitable. And we can readily see why this should be so. Every animal is continually creating poisons within its organism; so much so that a clever French physician called the human body "a factory of poisons." But continually, also, these poisons are being excreted, or got rid of—through the lungs, the skin, the kidneys, etc. If they were not, we should die. When, now, we kill an animal suddenly,—as we kill an ox or a sheep,—the poisons, which would

[1] Full details as to diet, etc., will be found in a work by the present author, entitled "The Natural Food of Man."

have been excreted an hour later, had the animal lived—are retained within the tissues of the animal, and are inseparable from them. So that when we eat the flesh of that animal, *we also eat these poisons.* It cannot be prevented. We, therefore, add poison to the poisons already existing within the body; and in this way unconsciously add to our diseased states. The result of this is that we induce disease, lessen the vitality, and ultimately shorten life, for these very reasons. We have thus, therefore, reached our first general conclusion, the *first* of the rules to be followed for prolonging life:

Do not eat much, if any, meat.

But besides proteid foods, there are others—fats, sugars and starches, as we have said. These also form a part of the diet, and a very important part. Sugars are, of course, contained in sweet foods—candy, dates, various desserts, etc. Fats are contained in butter, cream, lard, nuts, oils, etc. Starches in potatoes, breads, cereals, etc. In addition to these, there are the acids, contained in their best form in acid fruits, and in a less pure form in vinegar and similar acids. Organic salts are contained chiefly in various vegetables and fruits.

Sweets

We are just beginning to discover that sugar is a good food, and that the children's craving for candy and similar sweets is not a morbid craving, which should be prevented, but a normal one, which should be gratified. Sweet stuffs are very necessary, and should form a large part of the average diet. As the appetite becomes more normal, more sweet stuffs will probably be craved, and they should be eaten. Starches, while they are doubtless good foods, may readily be partaken of too freely, and they are the cause of fermentation and flatulence. Fats are needful to some small extent, but they also may readily be too freely indulged in, and cause a sallow complexion, biliousness, and an overworked liver. Acids will have a beneficial effect in such conditions.

Starch

As to starches, there is one interesting thing to be said. Starch, as such, can never be used by the body! It is always converted, first of all, into a species of grape-sugar, known as *glucose*—after first of all being converted into several intermediate products, of which the most important are dextrine, dextrose and maltose. This is all

done in the digestion of starches—the initial stage (starch into dextrine) being performed in the mouth, by the action of the saliva upon the starch, in mastication. More of this presently. The important point to remember now is that all starch must be converted into glucose, or grape-sugar, before it can be utilized by the body at all.[1]

Now, in fruits, we have glucose or grape-sugar, in its purest form, all ready for assimilation, combined with the purest of water! In a well-chosen combination of fruits are to be found starches and sugars enough for any human being; while the requisite fats and proteids may be found in nuts, or any of the other foods named above. An additional argument in favor of fruit as a food is that organic salts are found in them, which are not found in any other foods. Acids and water are also contained in great profusion. In addition to all this there is a certain "electrical vitality" which seems to be present in fruits and uncooked foods which is lost when these articles are cooked.

[1] When we toast a piece of bread, the outside, or "browned" portion, has most of its starch converted into dextrine by the action of the heat. For this reason toast is given to invalids—because it requires less work on the part of the digestive organs to convert it. Heat has this action upon grains and all starchy food.

For all these reasons, therefore, we feel safe in propounding the *second* of the great laws or rules of health and long life as follows:

Eat plentifully of fruits of all kinds; make them an essential part of your diet every day.

Food Combinations

Under the heading of "Quality" of food may come the consideration of the appropriate *combination*—a very important one, too! It has been said that "all foods agree with the consumer, but not with each other," and there is a certain amount of truth in this statement. Any food, eaten by itself, does but little harm; but its combination with all sorts of other foods, at the same meal, may cause great distress and ultimate injury. When foods disagree with each other, bad chemical combinations are formed, gases are created, which cause much distress; and bacterial action is produced, which has a decidedly harmful effect upon the individual. Our conclusion is, therefore:

Avoid all bad food combinations.

In general, it may be said that vegetables and fruits do not agree with one another very well; nor do cooked and uncooked foods at the same meal. If they *must* be eaten together, the fruits

should be eaten *first*, and the vegetables afterward. If meat is eaten, peas and beans should not appear on the table at the same time,—or too much proteid will be eaten at the same meal. This subject of food combinations is a very complicated one. Those interested in this branch of the subject had best consult: "Uncooked Foods," by Eugene Christian; "The Natural Food of Man," by the present author; or "The Family Food," by T. C. O'Donnell.

Quantity of Food

We now come to the very important question of the quantity of food necessary to sustain life, and maintain it in the best possible health. This is an even more important factor than the last, since I believe that the proper and right *amount* of food, no matter what it may be, or in what combination, is less harmful than too much or too little food of the very best. This question, therefore, becomes one of the most important in our discussion of the causes of old age.

In order to ascertain the right amount of food necessary for the proper sustenance of the body, one or two remarks are necessitated, when we shall be better enabled to see the effects of too

much or too little food, as the case may be, upon the body.

Every muscular effort we make, every thought we think, wastes the bodily tissues; they are broken down or destroyed by the effort. This loss is made good by the food we eat, so that, to maintain the best possible health, *the equivalence between the "income" and the "outgo" should be maintained;* we should eat just *enough* (not more and not less than is required to keep the body in this state of physiological equilibrium—"that just balance we call health"). *Less* than this amount causes weakness, depletion, exhaustion, loss of weight, and all the symptoms of starvation. *More* than the required amount has the effect of clogging the body with an excess of effete material, of choking and blocking it, and ultimately causing no end of mischief by reason of this excess.

Of the two, chronic undereating is doubtless the more detrimental; since excess of food can be disposed of by the system without any great and immediate injury,—if not too long indulged in. But as a matter of fact there is almost no danger of this in our modern civilization. *Our* great danger is overeating. It is this which we almost all constantly indulge in, and which we must re-

duce if we wish to live a long, happy and healthy life. Nearly all very old men and women give, as the cause of their exceptionally robust state of health, the fact of their extreme *simplicity of diet.* They one and all contend that this is the secret of their perpetual youth. Captain Diamond, of California, was 110 years of age when last I heard of him, and walked fifteen or twenty miles a day, as a book-agent. He asserted that he maintained the best physical and mental health. His diet consisted almost exclusively of fruit and nuts, with an allowance of olive oil and bread.

Food Fallacies

It has been calculated by several dietetic authorities that one pound of food *per diem* is enough for all ordinary needs—sixteen ounces of food.[1] But instead of this, we find the average person eating two or three, or even four or five pounds of food a day, and even forcing themselves to do so under the mistaken impression that they *must*, in order to "keep up the strength," etc. Never was there a greater or more harmful

[1] See "Air, Food and Exercises," by A. Rabagliati, M. D., p. 286; Carrington, "Vitality, Fasting and Nutrition," pp 470–471, etc.

fallacy. Food eaten under such circumstances *does not strengthen;* on the contrary, it weakens and engenders disease, and the more we eat, the weaker we become. Have we not often seen a man or a woman, thin, weak and emaciated, eating three or four hearty meals a day, and declaring that he (or she) can get "no good" from the food? They never will—until less be eaten! The body can only utilize and derive benefit from as much food as can profitably be assimilated; and this in proportion to its *needs, not* in proportion to the amount eaten. If the body is ill, it requires very little food,—as it is nearly always ill for the same reason—being choked and blocked by an excess of mal-assimilated food material. When a man is too fat, it is an indication that he is eating too much, and his digestive organs assimilate a large proportion of his food. When a man is too thin, it is also a sign that he is eating too much, and he should eat less in order to gain the requisite weight. This looks like "heads I win, and tails you lose"; and appears at first sight a complete paradox. The reason will, however, become clearer as we proceed. And this brings us to the great question of *fasting*, as a cure for such conditions,—as a means of prolonging life.

Fasting

When a man overeats, and grows fat, it is hardly necessary to insist upon the fact that he should eat less in order to recover his proper weight, health and strength. But the opposite of this may not appear so obvious. In order for us to understand it, we must first of all consider one or two questions in physiology.

We all know that the blood leaves the heart by means of the arteries, and returns through the veins, from the extremities. The nutrition of these extremities is by means of tiny vessels called *capillaries*, so small in diameter that they have to be studied by means of a microscope. Now, it is obvious that a very small amount of solid or earthy matter in the blood will suffice to clog up these minute vessels, and hence impede the circulation of these parts,—which suffer, in consequence, from lack of nutrition, or proper food supply. Now, when the blood is laden with an excess of this too-solid material (the result of overeating) these tiny vessels become choked and blocked, and prevent the proper food supply from being carried to these parts. In order to allow this, we should remove the clogging material, and thus allow a freer circulation in the parts. And

this can only be done by giving less food, and permitting a certain amount of absorption to take place; and not by giving more food, and increasing the clogging, and consequent anæmia and mal-nutrition. This is a very simple principle, when once understood, but is one, nevertheless, which even the majority of physicians do not properly appreciate. It teaches us that fasting is the great panacea in nearly all the ills to which flesh is heir. A short fast now and then will injure no one, and benefit almost everybody. We thus, therefore, arrive at another great law of longevity:

Fast completely one day of every month; and whenever indisposed, omit a few meals, until natural hunger returns.

It may be thought that I have devoted too much time and space to this question of food, but I do not think so. It is the most powerful factor for good or ill in our modern civilization; and if I have dwelt upon it thus at length, it is because of this importance. A trial will convince any one that this is so. A simplification of the diet, both as to its quality and its quantity, is one of the first and most essential requirements for prolonging life; for postponing death; and for making the life we do possess enjoyable, healthy

and happy. It is thus one of the most essential elements in the successful prolongation of life.

Alcohol

I now feel that I should say a few words in regard to the use of alcohol in its various forms, though so much has been said on this subject already. It is well known that alcohol is bad for the constitution and we are aware of the ill effects of its too frequent use. Being a stimulant, it wastes vitality, in the way all stimulants do; and in many cases it leads to intoxication, with its train of evil consequences. It is not generally recognized that every stimulant in time loses its effects; that the organism no longer reacts to that stimulant; and in order to obtain the desired results, a stimulant of a higher order must he resorted to. For this reason tea and coffee are pernicious—for they both have their own particular poisons, which act detrimentally upon the system—theine, caffeine, etc. Meat itself is a stimulant, and calls for one higher. As it is the most stimulating of all solid foods, it calls for one in liquid form; and for this reason there is a definite connection between meat-eating and drink. Many institutions for the cause of drunk-

enness are based upon this principle; their patients are not supplied with meat during the cure. The appetite for drink is lost far more readily under such circumstances. I have never known a vegetarian who cared for alcohol in any of its forms; and I doubt if such a craving would be possible. In the case before us, as in many others, abstinence is easier than temperance; one drink calls for another; and so on *ad infinitum*. Do not cultivate the desire for drink, whatever you do; and if you have an inherited weakness in this direction, it may in nearly all cases be overcome by adopting a rigidly abstemious diet, exclusively vegetarian. Under such circumstances, the craving for drink would undoubtedly be overcome with but little mental effort.

Smoking

The habit of smoking is one often contracted early in life, and once acquired, it is only with difficulty, in most cases, that it is broken. There can be no doubt that "nicotine poisoning" has a decidedly harmful effect upon the heart, though if the smoke has not been inhaled, this may be overrated. Personally, I am inclined to think that much of the harm of cigarette smoking lies in the

habits of laziness which it engenders, as much as in the actual poison itself. I knew a very brilliant young man, active, alert, clever. He was a great worker on occasion. At other times, he felt that he would like to take a cigarette before he commenced work. The work languished, under the spell of the golden weed; one cigarette called for another; and at the end of the evening, not half the amount of work had been accomplished which would have been done had not the desire for smoking been given way to. Thus one, who might have been a strong and brilliant light in his world of letters, succeeded only in becoming—as Stevenson expressed it—a "gentlemanly failure." Habits of laziness are thus encouraged, which are most harmful to both body and mind. In addition to which, there is the undoubted action of the nicotine poison on the heart, which in many cases is most detrimental and to some persons has proved even fatal. As a general thing, smoking must be set down as one of the luxuries to be avoided, if long life is to be attained.

Diet in Old Age

It is generally believed that old persons should eat more than younger ones, for the reason that

they are weaker, and consequently need more food in order to "give them more energy." This, however, is a great mistake, and precisely the reverse of this is the case. This fallacy has doubtless been the cause of thousands of premature deaths, and the cause of much suffering in old persons, as well as the cause of their premature death.

Sir Henry Thomson, one of England's greatest authorities in food, wrote a great deal on this subject of diet for the aged, and especially in his two works, "Food and Feeding," and "Diet in Relation to Age," etc., he constantly contended that old persons should eat, not more but *less*, food. And the reason is simple enough.

In the first place, the amount of tissue which is broken down by the day's activities is very small in aged persons, owing to their sedentary habits. They take but little exercise, and the circulation is sluggish, etc. The tissue-exchanges are, therefore, slow, and require but little new material to effect their replacement. In the young, on the contrary, where active exercise is indulged in, much tissue is broken down, and more food is needed. Judged from this standpoint, then, the aged should require very little food.

In the next place, growth is not taking place in

the aged; in fact the weight decreases from year to year. No food is, therefore, required for growth; only for maintaining the body. This is far less than is generally imagined.

Then, in the aged, the various organs of digestion cannot function as they did in youth and maturity. As we have shown elsewhere, the various digestive secretions are weak and deficient in quantity—saliva, gastric juice, the various intestinal secretions, etc. Again, the walls of the intestine are unable to absorb properly, owing to induration and ossification having set in. No matter how much food be eaten, only a small amount of it can be digested. The vitality is at a low ebb, and as a great quantity of this is required to digest and properly assimilate food, it is certain that on this account the aged cannot digest the quantity which the young dispose of. Finally, in the aged, there is already stored up a quantity of mal-assimilated food, in all probability, owing to the years he has lived more or less contrary to the laws of nature in this respect. For all these reasons, therefore (and many others which it would take too long to go into in this place), it is certain that the quantity of food in the aged should be reduced, and not increased; and should

be very greatly lessened, until but a small amount is eaten. This should be spread over *three small* meals, as against *two heavier* meals in the younger man. If the teeth are defective, the food should also be largely in liquid form, or thoroughly masticated. And this brings me to two points which are of great importance, and which have not, so far, been mentioned. I refer to (1) the no-breakfast plan; and (2) the subject of mastication.

The No-Breakfast Plan

Dr. E. H. Dewey was the first physician in America to advocate this plan, which now has a very large following; while on the continent of Europe hardly any one eats a hearty breakfast, as in America. I myself have not eaten breakfast for nearly ten years; and take my first meal at about one o'clock in the day. Many of my friends do likewise. The object is to give the system a chance to "catch up" the food and the necessary repairs from the preceding day, before giving the body more work to perform; and the system works admirably. A glass or two of water should be taken as soon as you arise in the morning, but no solid food until noon.

Those who follow this advice (and all may learn

to do so, by gradually diminishing the amount at breakfast, and taking the meal a little later each day, until the noon hour is reached) are unanimous in declaring that they would not return to the morning meal again for any amount of money; the hunger for it has entirely disappeared, and they feel far better and more energetic in consequence. Further, headaches, etc., have entirely vanished, in many cases, as the result of following this advice,—which no other system of medication was able to cure. I cannot argue this position here at any length, and can only refer the reader to former writings by the present author, in which this question is treated at considerable length. But I believe strongly that this plan of omitting the breakfast and eating only two meals a day is, in virtually all cases, of tremendous benefit; and one of the most potent means known to us of conserving the vitality, and enabling the individual following this advice to attain a happy, hearty old age far more easily and more surely than one who eats three meals a day, in conformity with the customary plan.

Mastication

The importance of masticating the food is gen-

erally known, and followed in a half-hearted fashion by many persons. They do not realize, however, the great importance of this subject, and how great an influence thorough mastication plays in the health of the body. I should advise those who desire to ascertain the facts in this matter to read Mr. Horace Fletcher's book, "The New Glutton or Epicure," and I believe they will be convinced (perhaps for the first time) that thorough mastication is all-important, if health is to be maintained. A rapid summary of the chief reasons may prove of benefit to the reader:

In the first place, mastication subdivides the food in the mouth, enabling the gastric and intestinal juices to act upon the food more easily. This saves the bowel an enormous amount of work by breaking up all this solid food; and thus a great saving of vital energy is effected.

But the action of mastication is not only mechanical; it is also chemical. The saliva in the mouth mixes with the food, and in some foods the first stage of digestion is performed in the mouth. With starches particularly this digestion takes place in the mouth by means of the saliva; and as starch cannot be converted by means of an acid medium, as for example the gastric juice of the

stomach, it has to wait until it reaches the bowel before this can again take place; and this of course throws a great deal of unnecessary work upon the internal organs, which might just as well be done in the mouth. This is again a waste of vital energy; and like all wastes of the kind, tends to induce disease and hence shorten life.

A third important reason why thorough mastication should be performed is that it prevents the individual from eating too much. The advantages of this have already been pointed out, and do not need to be repeated. Other reasons might be given, but the above will at least suffice to indicate the very great benefit to be derived from proper mastication, and the importance of practicing it if old age and a long life, free from disease, are to be attained.

To sum up in a few words: *Omit breakfast.*
Masticate very thoroughly.

Teeth, Ears, Eyes, Etc.

There are two other important rules for the attainment of a long life.

It is most important to preserve the *teeth* as long as possible—which is now quite an easy matter, comparatively, thanks to the perfection of Amer-

ican dentistry. It never pays to neglect the teeth. They should be examined and attended to at least twice a year, and the saving in pain and bodily comfort will more than repay for the additional financial expense. We must remember that if the teeth are imperfect, it is practically impossible to masticate our food sufficiently ; and upon thorough mastication good health depends. The external care of the teeth is the province of the dentist—except in so far as keeping them perfectly clean and well brushed is concerned. This should be done every morning and evening, and if possible after each meal. Gritty tooth-powders are to be avoided. Meat fibers are a great cause of decay in teeth. Sweets are not as a rule injurious—contrary to the customary belief—but mineral acids are. Alternate hot and cold drinks tend to crack the enamel, and afford an entrance for "germs" which bring about their decay. Cleanliness is the best preserver of the teeth. In addition to this, the condition of the teeth depends upon their nutrition—their internal blood supply ; and this is also a matter of diet. Fruits supply the necessary organic salts, and if the teeth are inclined to be chalky, foods should be eaten which are rich in lime. Many a toothache

is caused by overeating, and can readily be cured by a day or two of total abstinence from food.

Similarly, the eyes, ears, hair, etc., should be attended to with the utmost care. So much has already been written on all these questions, however, that I need not say more in this place concerning them.

After this great question of the regulation of food come several others, which we may consider in turn. They all have their effects upon the question before us—the prolongation of life.

Water Drinking

This is very important, as we can see when we consider the fact that about three-quarters of the human body is composed of water! The circulation of this fluid, in more or less compound forms, throughout the body, is immense. Every day, as a matter of fact, more than six tons of blood is pumped by the heart throughout all the ramifications of the numerous blood-vessels—along tubes, large and small, which circulate throughout the body. One of the great contributary causes of old age and of ossification and induration (the most prominent factors in old age, as we shall presently see) is found to be the lack of sufficient

water in the system. Indeed, Dr. Trall defined death, years ago, as "a condition in which the fluids of the body have become so disproportioned to the solids that life can no longer circulate and manifest through it." It will be seen from this how important water is.

Lack of sufficient water is also one of the greatest causes of constipation, which is universally recognized as of great detriment to the system. When the bowel becomes dry, the coats contract, and retain the material which should be expelled. A greater amount of fluid will assist in its expulsion. This is the principle utilized in "purgatives." They are all essentially *poisons*; and when they find their way into the bowel, nature seeks to get rid of them as rapidly and as effectually as possible. She does this by pouring out the intestinal juices, in an effort to dilute and wash through this poisonous material, before great harm is done. The result is that a violent action of the bowels takes place in this effort to rid the system of the intruder. This is the true action of the purgative —being in reality the reaction of the body against the poison. But these results could be attained more easily and less injuriously by other means, in the majority of cases—by fruit eating and

plenty of water drinking; and when such a state supervenes, copious water drinking and the taking of an enema should be at once resorted to. By these means a healthy action of the bowels can always be brought about without filling the system with poisons (as is done when we take purgatives and laxatives, or various concoctions of drugs, of which we know little or nothing regarding their action upon the body).

We are led, as the result of this discussion, therefore, to yet another of our rules for health and longevity:

Drink at least four glasses of water daily; and, when feverish, ill, or indisposed, double this number until you are again well.

Metchnikoff's Theory of "Sour Milk"

Of late years M. Metchnikoff, of Paris, has created a considerable stir by his theory of lactic acid, as a cure for, and prevention of, old age. The theory is based upon perfectly well-understood principles, and has a great deal to recommend it. In brief, the theory is this:

It is well known that the large intestine,—the colon, etc.—retains food longer than it should, and bacterial action goes on in the bowel, which

should not occur. The result is that gases are formed, and also poisons, which are absorbed by the tiny vessels on the walls of the bowel, poisoning the entire blood stream (auto-intoxication). These tend materially to shorten life, and to engender disease, as we have seen. The action of these intestinal bacteria must be stopped, Metchnikoff says, if we are to lengthen life, and stop their harmful activity. He accordingly set about ascertaining a means of killing these bacteria, without injuring the body at the same time; and came to the conclusion that lactic acid was a sure means of killing these bacteria, without in any way injuring the bowel. This lactic acid is contained in soured milk of a certain kind; and hence Metchnikoff recommends the drinking of soured milk, as a means of lengthening life and ridding the system of some of its poisons. For this reason, many persons to-day drink buttermilk, or various artificially soured milks, in the hope of accomplishing these results.

The Theory Disputed

The theory, so far as it goes, is doubtless correct, and many persons have derived great benefit from this treatment. The question is: Does it go

far enough? Is it a safe means of prolonging life and preventing old age? The indications are that it is *not;* and the reasons are not far to seek.

Granting the correctness of the argument,—that such bacteria exist; that they poison the system; that soured milk kills them, etc., still the argument would not hold indefinitely. For is it not obvious that this treatment is merely tinkering with effects—trying to offset and cure a condition which is already there, rather than endeavoring to prevent its occurrence? Let us suppose that all the bacteria are killed. Under the existing modes of life, and the present food-habits of the people, they would soon be in the bowel again in innumerable numbers; and they would have to be got rid of again; and so on indefinitely! To be sure, this is better than nothing; but would it not be far better to regulate the diet and the habits of life so that bacteria do not and cannot accumulate in this manner? Assuredly it would. Instead, therefore, of killing the bacteria, once in the bowel, it is better to ascertain the cause of their existence there; and then so regulate the life that they will no longer be found there. That would certainly seem the more rational method.

Is there such a diet, such a method of life? Most assuredly there is. Bacteria exist in the bowel because we have eaten too much food and food of a wrong kind, and this affords the ground or "soil" for their growth and habitation. Germs cannot exist in a sweet, clean bowel. They are the natural scavengers of the body; and eat only refuse and offal. When the body is in perfect health, they are never found.

All we have to do, therefore, is to keep the bowel sweet and clean, and no such bacteria will be found; and hence no soured milk will be required. And all we have to do, to keep the bowel clean in this manner, is to eat only as much food as the body requires; and live mainly upon simple foods, including quantities of fruit. Were this done, Metchnikoff's treatment would not be required.

Air and Breathing

When a man is strangled, or dies as the result of hanging or choking, he dies in a very few minutes, and his blood, when it is examined, is found to be almost *black*, instead of the bright scarlet which is the color of healthy blood. This is a very curious phenomenon. Why should this be

so? The reason is that the blood has passed through the lungs and circulated through the body several times without being oxygenated, or meeting with any oxygen in the lungs of the unfortunate man, and, instead of being purified in each one of its circulations—as is usually the case—it becomes more and more vitiated and laden with waste products, until it becomes the color we see. It is virtually a death by poisoning. Most people have an idea that they are constructed like a pair of bellows, and that if anything punctures them, they will blow up, or something equally awful will take place! As a matter of fact, this is not the case at all. The windpipe can be cut right through, and the patient easily recover, provided no great blood-vessel has been cut in the process. In all cases of strangulation, death takes place because the body is poisoned; not because the lungs cannot act for two or three minutes at a time.

Bad Air a Poison

But because of its purifying effects, air is most essential, and pure air at that. Air which has been exhausted of all its oxygen acts in very much the same way as slow strangulation—the

blood stream becomes gradually poisoned. Oxygen is the essential factor in air, the nitrogen being inert and useless for us. When the windows have been shut for a certain length of time, the oxygen gets exhausted, and then, if the windows are not opened, and a fresh supply obtained, the blood becomes poisoned, and the mental and physical health suffer. The body ceases to be built up of sound material; and the way is paved for various diseases. Further, the blood, circulating as it does to all the delicate nerve centers of the brain, poisons them, causing irritability and various mental troubles which the patient does not understand, or know the cause of. It has been ascertained by direct experiment that the nerve cells in the brain are easily poisoned, since there exists in the cortex very limited means of disposing of any poisons formed; and more than this, when the brain cell is irritated by a poison from without, it in turn secretes a poison, thus doubling the harmful substances in the brain. Doubtless these are the causes which are largely to blame for many of the lesser insanities—poison generated in the system as the result of too much food and insufficient pure air.

The practical upshot from all this is that we

must insist upon a plentiful supply of fresh air at all times—summer and winter; by night and by day. Of course, less ventilation is needed in the winter than in the summer, because of the antiseptic properties of cold air, and the increased draught always present when air at very different temperatures is approximated. But this can easily be overcome by proper arrangement, and plenty of air secured all the year round. One very good way to bring this about is to push up the lower window a few inches, and insert in the space thus left a strip of wood, which exactly fits it. This will effectually block this opening, but a space will be left between the lower and the upper windows, which will throw the cold air upward into the room, and thus evenly distribute it, without unpleasant cold in any one part of the room. In this way, draughts (even though their harmful effects are practically *nil*, when the body is in sound health) are altogether avoided.

Yawning

An example of the effects of insufficient breathing is found in the phenomenon of yawning. What is a yawn? and why do we yawn, when tired or sleepy?

This is an interesting question, which for long remained unanswered. It is now, however, pretty well understood, and affords us another beautiful example of the wise provisions of nature.

When we are tired or sleepy, we often unconsciously allow the breathing to become shallow; the muscles are not properly exercised and carbonic acid gas accumulates in the air cells. After this has gone on for some time, Nature makes an effort to right matters, and again stirs up activity in the cells and the lazy muscles of the chest and lungs. This she does in *a yawn*. As you will notice, when this occurs, the entire body is stretched out and made tense; the arms are usually raised over the head; the chest and trunk are expanded; the lungs and walls of the chest are pushed out, and finally, with a gasping sound, the mouth is opened wide, and a deep inhalation is made, filling the lungs, extending the chest and the diaphragm, and exercising the internal walls of the thorax generally. This is a yawn; and for this reason Nature induces us to take it—to overcome certain obstacles which inactivity for too long a time has brought about. A dozen deep breaths will dispel the desire to yawn in every case.

"Night Air"

Many people have an idea that, while day air is good, night air is "damp," and should be avoided! Never was there a more harmful superstition than this, or one which has wrecked so many lives. What other air is there at night but night air? Is it to be supposed that Nature would provide us with harmful air, just because the sun happens to be shining on Australia or China rather than upon us? The air at night is the *same* air as that we breathe in the daytime, with the single exception that it may be a trifle more damp But in damp weather we breathe such air, without experiencing any ill effects; and further, there is a special apparatus in the body which artificially dampens every bit of air we breathe before it enters the lungs! The lining of the nose, throat and tubes which lead to the lungs are constantly kept moist by certain secretions which have no other function *but* this to attend to. Evidently, therefore, it is the intention of Nature that all the air breathed should be moistened by the body before it reaches the lungs; and this being the case it is obvious that night air is no more harmful than day air, or any other air; it is just as beneficial, and the close,

stuffy air of the bedroom is just as harmful as the close, stuffy air of the living-room, during the day. Oxygen is just as necessary, if not *more* necessary, at night, because certain nutritional changes take place with greater rapidity. This being the case, we are in a position to appreciate the importance of the following great law of longevity:

Breathe pure air at all times, day and night, in the house or out of it; and, if indoors, see that the windows are so arranged as to give a plentiful supply of fresh air.

Exercise

There can be no doubt that the average business man (in America at all events) takes far too little exercise. In England, sport always occupies a prominent place in every man's life, and he continues his outdoor exercise until well on in life, very often. But in this country exercise is generally discontinued at about twenty; and, thenceforward, but little exercise is ever taken. Yet a certain amount is needed every day, as nearly every one knows; and the only reason it is not taken is because most people are too lazy to begin! This is the real reason. But it is not difficult or

hard, if one but knew *how*. The right way to begin is just as easy as the wrong way is difficult. The wrong way, the hard way, is to procure a pair of dumb-bells and endeavor to go through a regular course of exercises every morning. This will only end in mental nausea, and will almost certainly be abandoned after a few days. The beginning should be made as easy as possible, and as enjoyable. Here is one way to begin.

When you arise in the morning, if it is a cold day, go to the window and throw it open; take a dozen full breaths, inhaling as deeply as possible. The stimulus of the cold air will make you *want* to take a few vigorous exercises, simply as a means of self-defense—as a means to keep warm. That is enough for the first few days. When you go to your office try to walk as briskly as possible, and, throwing the shoulders well back, inhale deep breaths as you go. In a few days, the good effects of this will be noticed in an increased energy; and a few more exercises may be taken. The great incentive is *interest*. If you live in a large city, join a tennis club, or endeavor to find some sport which will interest and amuse you at the same time you are exercising. In this way you will be enabled to gain a great deal of exercise without

knowing that you are taking any. In the country, this will be doubly easy. Kicking about a football in an empty field is excellent practice; and may be taken almost the whole year round. When once you have acquired an interest in your body, you will find that exercise will be as easy for you as it was before difficult.

Exercise in Bed

Many, who are too weak to exercise in the regular manner, may gain great benefit from *exercising in bed*, tensing all the muscles in turn throughout the body. A book has recently been issued on this subject, to which the interested reader may like to refer. In many cases, special organs may need exercise, or special stimulation, more than others, as for instance the liver, which is inclined to get sluggish, with the majority of persons. This organ needs special attention, and for that there is nothing better than the beneficial exercise known as the "liver squeezer," which is as follows: Stand erect, arms to the sides. Bend each arm, so that the hands are in front of the body, the elbow being at right angles to the upper arm. In this position turn the body sideways first to the right as far as possible, then to the left—that

is, the right shoulder swinging round to the chin, as the head is held straight; then the left shoulder in the same manner. All this time the feet must not be moved from the floor, and the lower portion of the body should be held as stationary as possible. This will be found very beneficial. Exercises for sluggish bowels are walking, running, skipping rope, etc. Bending down and touching the toes without bending the knees is also a splendid exercise; and if a deep breath be inhaled as the body is bent forward, the viscera are compressed between the expanded lungs on one side and the compressed portion of the body on the other, and squeezed like a sponge; only to be expanded again as the body is straightened. Lying flat on the back, and raising both legs in the air, without bending the knees, is also a fine exercise—though this should be attempted gradually, for fear of rupture. Bending sideways as far as possible is also a very good exercise—in fact, all those which strengthen the muscles round the waist line will be found of special benefit. The muscular system of the whole body should, however, be exercised in turn—the neck, arms, back, calf, thighs, etc., as well as the biceps only, which many develop at the expense of all else. If this is persisted

in, one is apt to get "muscle bound," as it is called, the consequence being that it is impossible to straighten out the arm completely, and thus great clumsiness results. It is better to seek the advice of some competent authority before indulging in a steady course of exercise, so that you may be sure that the muscular system is being developed equally instead of one-half being developed at the expense of the rest.

Exercise is needed for various reasons. In the first place, it stimulates the sluggish circulation, and forces all parts of the body to function more rapidly, thus carrying away a great deal of dead and poisonous matter. In the next place, it supplies the tissues with nutriment which they need. These are its two chief functions. Besides which there are many more,—lesser ones. At all events, we must appreciate the importance of the law of life and health, here stated:

Excercise a certain amount every day, using ALL *the muscles in turn, so that none are neglected. This should be continued until* SLIGHTLY *fatigued.*

Rest and Sleep

After exercise—rest! Action, reaction, *periodicity*, is the apparent law of the universe. The

more we have exercised, the more we need rest—just as a pendulum will swing more forcibly in one direction the further we have pushed it in the opposite direction. When exercise is taken, certain poisons are formed, which are known as fatigue poisons, and rest is necessary in order to allow the blood to carry off these poisons, for otherwise they would accumulate and poison us throughout by their action. Also, the nerve-cells become exhausted, and need repose. We may compare the tiny nerve-cells throughout the body to innumerable little cups, filled with water (energy) which drips away as mental or physical exercise is taken. When the cups are full there is an abundance of water to draw upon. When they are half empty, we can still live without showing any very great signs of wear and tear; but there is less reserve, nevertheless; while, if the cups are nearly empty, grave danger is experienced of a famine and bankruptcy. It is the same with the nerve-cells. When they are filled, we have a fund of reserve energy, which may be safely drawn upon in time of need. Most of us go through life with them half filled, in which condition they become nearly emptied every day, before night, and we need sleep to replenish them

for the labors of the next day; we are unable to withstand, with safety, any prolonged drain upon our resources. And again they may be perpetually in a state bordering upon exhaustion,—when we have morbid processes and conditions—neurasthenia, nervous exhaustion, fatigue, etc. The physiological analogy is almost perfect.

From all this, it may readily be seen that it is of the utmost importance to keep the little cups—the nerve-cells—filled brimful of energy, giving us a reserve, not only to meet, the better, the possible drain of special expenditures, but also to enable us to offset the possible ravages of disease. When the vitality is high, there need be little fear that any serious disease will attack the patient—in fact, this fund of energy guarantees that no disease is present, nor can it safely find lodgment within that organism.

How, then, are we to insure this much-desired result? How provide for this contingency? In two ways: (1) Prevent the loss of what energy we have; and (2) Accumulate more energy.

How to Prevent Loss of Energy

If, when you are seated at a table, or even lying down in bed, you examine your bodily condition,

you will find that you are in a state of constant nervous tension—the muscles all over the body being contracted and strained in an unnatural position. This is one great means of wasting energy, and the sooner stopped the better. You can easily learn to stop it, however, in the following manner.

Lie upon a couch or bed, closing the eyes and making yourself as comfortable as possible. Relax every part of the body. Now think of your neck, and you will find these muscles strained and holding your head up, without your knowledge. Relax them, letting the head sink back into the cushions, and allowing the bed to support its entire weight. Try to make it heavy. When you have succeeded in doing this, go next (in thought) to the right arm, and learn to relax that in a similar manner; then to the left arm; then to the right leg, then to the left; and finally allow the entire trunk to rest upon the bed, relaxing it as much as possible. By the time you have gone completely round your body, it is time to commence at your neck again, and you will probably find that, in the effort to relax the rest of the body, your neck muscles will have become all tightened up again. Relax in turn, and practice

this exercise every day for five or ten minutes. You will find it a wonderful relief. It will soothe and refresh you, and often be the means of curing headache and nervousness which nothing else would eradicate. Practice it every day for a week, and see the good results!

When going to bed, relax in this same manner, and you will find it often induces sleep. It is often very beneficial to take deep breathing exercises in connection with this. This is one great means of preventing loss of energy.

Another means is to watch yourself during the day, and at once slacken any unnecessary tension. Probably you will find yourself tapping the floor with your foot, pacing to and fro, drumming on the table with your fingers, etc., when in thought. Check such habits at once; they are great "energy wasters." When you write, if you find that you grip the pen as though it were trying to wiggle away from you, relax your hold, and grasp it gently. If, when you are thinking, you find your brows knitted together, your brain tense with thought, *relax*, and you will find that you will be enabled to think more clearly and for a longer period at a time than if you contracted yourself like a cruller! The same principle applies throughout. When-

ever a strain, bodily or mental, is noted, relax at once. A great man made the following his maxim in life, and said it helped him more than any other: "Under all circumstances keep an even mind." Go thou and do likewise!

How to Accumulate More Energy

This is often a difficult process, and takes a considerable time. When once the vital fires have run low, it is a difficult matter to build them up again. But as all health, strength and longevity depend upon this replenishing of the fires of life, it will be seen what a very important place it must occupy in the scheme of things. Let us then consider for a few moments this question of lowered vitality, and the means of replenishing it—of filling the "little cups," to use an analogy employed before.

Lowered Temperature

One sure sign of lessened vitality is lowered temperature, and when this is decided and permanent, the condition is more or less serious. The normal temperature of the body is about 98.4° F., and above this denotes a feverish condition, which it is generally easy to lower promptly by water

applications, profuse water drinking and fasting; but below this denotes impoverished blood, and a weakened condition of the body which often takes months and even years to build up. I have already discussed this question, and gone into it so thoroughly in my "Vitality, Fasting and Nutrition," that I shall not do more than briefly refer to the facts. They are, however, undoubted. A clinical thermometer would indicate this to you in less than a minute, and the experiment might mean a great deal to you, by way of indicating your present condition.

Aside from this, however, many other symptoms indicate impaired vitality—and nutrition. Fatigue at slight effort; the inability to perform any sustained, concentrated work; lassitude, bad complexion, constipation, the inability to concentrate, headaches, etc.,—these are all indications of lowered vitality and a bad state of bodily health. In short, if you are not in good physical training—able to take an enjoyment in life every minute you are alive—you are not really well, and require bodily care and attention.

When such conditions supervene, most people do either one of two things: eat more, in order to "keep up the strength," or fly to the drug

store, and dose themselves with all sorts of things, in order to regain their lost health. Both of these methods are quite useless; and in fact will only do more harm than good. I will show why.

Food Not Always Strength

(1) *Food*, it is said, gives us bodily energy. If you get weak, you must eat more; for does not every one know that he feels better and stronger after a meal than before it? Therefore, when you are ill and weakened, eat more, in order to gain more strength! This is the usual argument. But it is as harmful as it is false.

In the first place, I do not believe that the bodily energies are directly dependent upon the daily food in the degree commonly imagined; but for our present purposes, I shall suppose that they *are*, and treat the problem on that ground alone. Let us suppose, then, that we do usually gain our strength from food. Ought we to eat when ill or run down, even if so? We should not; for many reasons.

In the first place, unless one is really and truly hungry, the body does not secrete its digestive juices, which alone render digestion impossible.

Remember this: that the juices of the body are poured out, *not* in proportion to the amount of food eaten, *but* in proportion to the needs of the body. If, therefore, you need only half a pound of food, and you eat two pounds, only enough juices are secreted properly to assimilate half a pound. All the food is therefore badly digested, and does no real good.

In the next place, when you are run down, and the vitality is low, the body is unable to digest food properly, and hence everything you eat is mal-assimilated, and tends to poison the system—creating toxins, and thereby weakening the body still more. All digestion calls for a tremendous expenditure of vital energy, and, in disease, this energy is not capable of being spared; hence but little food should be eaten at this time.

The weakness we notice at such times is the weakness of food-poison, due to disease, and not the weakness due to lack of food. True it is that food *seems*, for the time being, to strengthen; but this is due to its stimulating properties, and not to its really strengthening power. The only way to regain real power, health and strength, is to eat very little—fast, in fact—and this will give the system a chance to clean itself; to become

freed from the poisons and diseased conditions from which it suffers. When this has been done, and not until then, will increased strength and vitality be noted.

Drugs

(2) *Now as to drugs.* The general impression is that all drugs act upon the system in a peculiar manner, causing it to do such and such things. Then why does not the drug act upon the bottle in which it is kept in the same manner? The reason, you will say, is that one is live or living matter, and the other is dead. But why does the drug only act upon living matter, and not upon dead? Did you ever stop to think of that? Does it not seem strange that a drug will act upon living matter and not upon dead matter? Why should this be?

The truth is that the drug does not "act" at all. The body reacts against the drug. *The action we see is all due to the living tissue, and not the drug.* Let me illustrate this. Suppose you take a purgative. It supposedly "acts" upon the bowels. As a matter of fact, what happens is this. When this drug (poison—for all drugs are more or less poisons) enters the

bowels, they react and pour out their secretions in an endeavor to wash through the poison as quickly as possible. They hurry it along, to rid the system of this dangerous enemy—and incidentally everything else which happens to be in the bowel is hurried along also. Finally, it is expelled. This is the true "action" of the purgative; why it acts upon living matter and not upon dead. (A purgative would not, of course, act upon a dead man.)

From this it will be seen how important it is to drink plentifully of water after a purgative of this kind; for it draws upon the juices of the body to a great extent. From this it will be seen that the action of a drug is the reaction of the body against the drug, and this means waste of vitality, and not an increase of it. Drugs are useless as a means of increasing the energy, and the strength they furnish is false and not true strength. It does not mean energy supplied; it means energy expended. This will become clearer when we consider the action of stimulants.

Stimulants

A stimulant is anything which increases the action of the heart and circulation, and the gen-

eral activities of the body. When the energies are low, stimulants are consequently administered, very frequently; and most people think that they are beneficial. Drug habits have been contracted in this manner. But are they good? Are they beneficial? How do they stimulate? What is their action?

When we answer these questions, we shall see that stimulants cannot possibly be good, under any ordinary circumstances. They never increase the vitality, but must invariably lower it. If we understood the real "action" of stimulants we should see this. I can show why by a very simple example.

Suppose you see a horse trotting slowly along the street. The driver gives it a cut with the whip, and the horse starts up and trots along faster. Does any one really suppose, in such a case, that the whip really *added* any energy to the horse—infused or put into it any vitality? Is it not rather obvious that the stimulus of the whip simply called forth more energy—rendered it more manifest, caused it to be expended more rapidly? Certainly that is the case. It is the same with all drugs. They merely act as spurs to the tired body, and cause its energy to be ex-

pended faster than it otherwise would be. They never *add* energy *to* the body; they always *abstract* energy *from* it. We must remember the great truth, that: *Energy is always noticed by us, as energy, in its expenditure, never in its accumulation.* Whenever added power is noticed, we may be sure that it is being expended. So that if you take a stimulant or a tonic, and immediately feel stronger and more energetic, it is a sure sign that your energy is being expended or wasted; and not that you are saving it and conserving it as you think. All stimulants and drugs, therefore, of this character, only waste the energies, and do not add to them. It is useless and worse than useless to try and increase your available stock of energy in this manner. It may seem to give you more strength; but, as a matter of fact, it is taking from you what you have. Experiment will prove this.

But if stimulants and tonics and drugs and food cannot supply us with more energy, what will? How can we get more vitality and more strength? This brings us back to our original theme: how to accumulate more energy, which I shall now illustrate. I merely wished to show, before doing so, the fallacy of the various common methods

which are usually employed; and why it is that these do not succeed and cannot succeed; and why, instead of permanently benefiting us, they do just the reverse, and have the tendency to engender disease and shorten life.

Sleep and Rest

We must recall the old maxim: "Energy is always noted in its expenditure; never in its accumulation." This is very important and should be learned and appreciated. Whenever one *feels* stronger, he is often *getting* weaker,—because he is expending his strength more rapidly. On the contrary, when one feels the weakest, one is often accumulating strength most rapidly—it is accumulating, and hence unnoticed.

We have a practical proof of these statements every day of our lives. For what gives us energy in the way nothing else can? What but "Nature's kind restorer, balmy sleep"? That is the great energy restorer; the only way in which we can permanently restore our strength and our energies. Is it not obvious that this is the fact? If we got our strength from food, as most people imagine, should we not, whenever tired, go first to the dining-room and then to the gymnasium,

and eat more food, and then burn it up in the body; and in this manner get more energy? But we know, as a matter of fact, that we cannot do this. There always comes a time when we must go to bed, and not to the dining-room, to recover our energies. Sleep is therefore the great energy restorer; it alone replaces in a permanent manner the energies lost by the day's activities. *Qui dort dine*, say the French: he who sleeps, dines. Rest is important at all times, also, whenever tired; and the body will call for that; but there is something peculiar about sleep which nothing else can equal. It stands alone in its unique recuperative power. We thus are enabled to formulate another great law of health and longevity:

Take as much sleep as you require every night; it is worth more than food or drink to you; it is the one thing you cannot omit without danger. Always take plenty of sleep!

Types of Individuals

All fine distinctions aside, there are two great divisions into one or other of which nearly every man can be placed. They are the nervous and phlegmatic types. The former are usually thin, wiry, active, nervous, and of a highly strung

temperament; the latter inclined to be stout, phlegmatic, slow, inactive and complaisant. These two types are often intermixed in odd combinations. Thus, some men of the second category are extremely energetic; whilst many thin men are "always tired," etc. It depends very largely upon their habits of life, and particularly upon their food-habits. "Temperament is temperament," and cannot easily be changed. Usually we waste time and valuable energy in trying to change it. The thin man should not try to add weight, so long as he remains well as he is; and the stout man should not try to reduce his weight by various artificial measures and remedies, so long as he keeps energetic and active. People undoubtedly run in "types," as other animals do. There is an old saying: "Did you ever see a thin pug-dog or a fat greyhound?" Never! It is much the same with human beings. Some of them are naturally greyhounds, and others are natural pug-dogs by temperament; and it is useless to try and change their inner being. Make the best of it as it is! It is probably better than most others. Every type has its advantages; find out yours, and develop it.

Of course, the question arises: Why is it that

some are naturally stout and others naturally thin? Generally, it is because the "stout" sort assimilate and utilize the food they eat; they get the benefit from it. The other, the "thin," do not. They may eat just as much, but they do not get much "good" out of their food. I have previously pointed out that this is because they have eaten too much. Many persons have increased their weight by omitting breakfast, or otherwise reducing their food supply.

Mental Influences

We have now to touch upon a phase or aspect of our subject which is most important, and which many may think I have neglected too long. I refer to the mental influences—the power of thought in prolonging life and making it happier, healthier, and longer at the same time. Much has been written on this subject already—so much, indeed, that one hesitates in writing anything more, without apologizing for doing so; but at the same time much that has been written is so far from being practical and sound that a little added discussion of this question, from a slightly different standpoint from that usually assumed, may not be without interest.

Mental Cures

In the first place, then, we hear much nowadays of the power and the influence of the mental states to induce, or, on the other hand, to cure disease. Strictly speaking, however, this is not true, in the sense generally imagined. It is the *emotions* which cause the damage, not the purely mental life; it is they which create the harm, poison the system and destroy the equilibrium of "that just balance we call health." Especially do the *suppressed* emotions do this, for when they are expressed or brought to the surface, they endanger the system far less. In fact, one of the most promising methods of cure of certain distressing mental and physical symptoms at the present day is to dispose of these suppressed emotional states, when the cure is found to follow of itself and naturally. For this purpose the patient is placed in what has been termed the "hypnoidal" state (a word coined by Dr. Boris Sidis) which is an intermediate condition between waking and sleeping, on the one hand, and waking and the hypnotic trance, on the other. In this semi-sleeping condition, when in a dark, quiet room, and perhaps lulled by the monotonous ticking of a metronome, the patient is asked to relax, and

describe any pictures which float before his mind. Often, scenes are thus revealed which took place in childhood,—and had been completely forgotten for years; but this scene, lurking in the background of the mind, was, nevertheless, the hidden cause of much mental and physical trouble, since it influenced, all unconsciously, the mental life, by "pressing" upon it, as it were, from below, and preventing its proper functioning. When this has once been brought to the surface and disposed of in this fashion, all trouble ceases. This is called the "cathartic" method of disposing of such mental conditions. It will at all events tend to show us the tremendous influence of the emotional states upon the mental and physical health; and how essential it is to rid ourselves from them, if possible.

Chemical Effect of Emotion

It is now known that the emotions have a distinctly physical and chemical effect upon the body. Prof. Elmer Gates, of Washington, D. C., conducted an ingenious series of experiments, some years ago, in which he proved this quite successfully. He incited, in a number of individuals, varied emotional and mental states, and

when they were at their height, he induced them to blow through a glass tube into a vessel containing certain chemical solutions. In all cases, a precipitate was formed, of varied colors—red, yellow, blue, green, etc.,—according to the emotion induced. Thus, each state was found to have its particular color, which could only have been formed by the chemical changes going on within the body by reason of the condition induced. Here, then, we have definite and tangible proof that chemical changes take place, and certain substances (poisons) are formed, as the result of excessive emotional activity.

It has lately been discovered that when nerve cells are exposed to the irritation of poisons, brought into contact with them, they in turn secrete poisons. While the body as a whole is pretty well able to eliminate these poisons, without serious trouble, the brain is very badly adapted to get rid of them; there is always a great difficulty in disposing of poisons which have been formed in the brain tissue. The result is that they remain there, creating still more harm, and if they are not soon removed by a process of absorption, they work serious and lasting damage.

Passion and Poison

How is it that such passions cause so great a mischief? In the first place, they create poisons, as we have just seen. In the next place, the distressing thoughts and emotions cramp and compress the body throughout, while the happy emotions, on the contrary, cause it to inwardly expand. Distressing emotions act upon the vasomotor centers which control the secretions and bodily functions generally; and in this manner the whole mechanism of the body is thrown out of gear, since all the bodily activities are controlled by this portion of the nervous system. (All, that is, except the higher conscious operations.) Dr. Sweetser, writing some years ago on this question, said:

"The agency of the passions in the production of disease, especially in the advanced stages of civilization, when men's relations are intimate, and their interests clash, and their nervous susceptibilities are exalted, can scarcely be adequately appreciated. It is doubtless to this more intense and multiplied action of the passions, in union, at times, with the abuse of the intellectual powers, that we are mainly to attribute the greater frequency of the disease of the heart and brain in the

cultivated than in the ruder states of society. Few, probably, ever suspect the amount of bodily infirmity and disease resulting from moral causes —how often the frame wastes, and premature decay comes on, under the corroding influence of some painful passion. . . . In delicate and sensitive constitutions, the operation of the painful passions is ever attended with the utmost danger; and should there exist a predisposition to any particular form of disease,—as consumption, or insanity,—it will generally be called into action under their strong and continued influence. . . . The painful passions act immediately upon the nervous system, directly depressing, distorting, expanding, and sometimes even annihilating its energies. . . . The mind is never agitated by any strong emotion without sensible change immediately ensuing in some one or more of the vital phenomena, and which, according to its nature, may be either morbid or sanitive in its effects. . . . The nervous system, subject to the depressing influences to which I have just referred, soon becomes shattered, and, in the end, all the energies, both of mind and body, sink under the afflictive burden."

It is now generally recognized that thought, and

even our dreams, can exert an influence upon the body and its functions. In this way old age can be hastened, premature decrepitude brought on, and the length of man's natural life undoubtedly shortened. Just *how* all this comes about is, perhaps, well shown in the following extract from M. Jean Finot's book, "The Philosophy of Long Life." In his chapter on "Will as a Means of Prolonging Life," he says:

"The forces of the mind, well utilized, may render us most important services from the point of view of the prolongation of life, as we have demonstrated elsewhere. It is suggestion ill-employed which undoubtedly shortens it. Arrived at a certain age, we drug ourselves with ideas of the approaching end. We lose faith in our powers, and they abandon us. Under the pretext of the weight of age upon our shoulders we gradually adopt sedentary habits. We cease to busy ourselves actively with our occupations. Little by little our blood, vitiated by idleness, together with the ill-renewed tissues, opens the door to all kinds of diseases. Premature old age attacks us, and we succumb sooner than we need in consequence of a harmful auto-suggestion."

Influence of Suggestion

"Let us try to live by auto-suggestion instead of dying by it. . . . Evil suggestions surround us on all sides. . . . Just as the hypochondriac begins to beam with happiness by continually repeating that he is gay, so persons obsessed by the thought of old age and death will think calmly of their approach. The unreasoning fear of them, by demoralizing their consciousness, only quickens their destroying march. Man, arrived at a certain age, or even at a certain mental state, undergoes a sort of auto-suggestion of death. He then believes himself to have reached the end of his days, and feeds as much upon the fear of death as upon daily foods. From this moment onward death fascinates him. He hears its call everywhere and always. The philosophic and salutary consciousness of a hereafter gives place to a cowardly and nervous fear of separation from life. The victim feeds upon this fear, intoxicates himself with it, and dies of it!"

From all this it will at least be seen that the mind has a powerful—almost an all-powerful—influence upon life and its possible prolongation. Let us therefore bear these facts in mind, and determine to follow the following law of health and longevity:

Think only helpful, cheerful, optimistic thoughts; never allow injurious or distressing thoughts to occupy the mind. "*Under all circumstances keep an even mind.*" *Fill the mind with good, clean, happy thoughts, and there will be room for none others —thoughts of premature old age, decay and death.*

In this way life may undoubtedly be prolonged many years, and will be far happier while it lasts.

Happiness

Happiness is so important a factor in health and long life that it deserves special mention. A famous English physician is reported to have said that there were just two roads to perfect health—"Open bowels and a cheerful mind." Certainly they are both of prime importance. A happy mood expands the whole being, allowing the bodily functions to be exercised to their fullest and best extent; while depressing mental states have the very reverse effect. The combination of words, "Cross, irritable dyspeptic," is too deeply rooted in the English language to be easily eradicated, and show that its footing is sure and deep.

Happiness by Will-Power

One thing is certain, which is that it is largely

a matter of *will-power* whether the mental life be happy or otherwise. We can control this state. Professor James showed that the mental life depends, very largely, upon the bodily expression assumed. If we assume the outward expression and attitude of anger, we feel angry; while if we force the face into a smile, no matter how angry we may feel, we begin to feel like smiling. It is the same throughout. The emotions, like the thoughts, are under the control of the will. Consequently we can change them if we determine to. At the same time, there is a great deal to learn in this connection. Happiness is a science, and may be learned, like any other science. The "Harmony Club," of New York, has been instituted for the express purpose of helping persons to "find themselves," and enabling them to find true happiness by pointing out the way in which it may be sought. There are many persons who have doubtless been aided and assisted very greatly by this means.

An Interest in Life—Hobbies

Above all things, it is, I believe, essential to have some special interest in life—some hobby—other than the usual occupations of the daily life.

It does not essentially matter how useless it is from the outside point of view. It may be collecting stamps or butterflies; it may consist in reading history or science; or the study of music, painting, the drama, and of the stage,—no matter what, there should be some hobby in life, to which the mind flies in times of need or distress, as though to a spring or well of comfort. A habit of reading good books is, perhaps, as wholesome a hobby as could be cultivated; for the mind is also educated at the same time. Read *good* books. It takes just as long to read a trashy book as a good one; and nothing is gained in the end (but, on the other hand, something lost) as a matter of fact, for the tendency of the reading of inferior literature is distinctly downward, and the style of the reader is unconsciously lowered to that extent. Many persons would find great relief, great solace and happiness—if not actual amusement and entertainment—in writing out their thoughts and ideas of men and things. Cultivate the habit of writing. Attempt a novel, founded on actual experiences in the past. It may never be published; but when once you have fairly begun to make a book, you will find immense interest generated as

it progresses, and the characters begin to live under your pen and fingers. Do not despair easily: the only way to learn to write is to write—often and constantly; and an improvement will be noted in every attempt. But the *act* of writing is what should be cultivated; that is what we are in search of at present. A hobby of this kind will add zest to life, and perhaps lengthen it by many years—making those years happier for this added interest.

Amusements

The hygienic value of amusement is most underrated by the majority of writers upon these subjects. . . . Exercise, unless it be undertaken in the spirit of play, loses half its value. A game of tennis or a climb up the side of a mountain will do the individual far more good than a methodical course of dumb-bell exercises or an hour's work in a close gymnasium. It vitalizes the system in an entirely different manner, and appears to be hygienic for the mind as well as the body. And this does not only hold good for physical exercises, but for all forms of activity and amusement. A visit to the theater will often prove of far greater tonic value than a dose of

medicine; a hearty laugh than a visit to a long-faced physician. The hygiene of laughter is yet to be appreciated. Not only does it act as a mental tonic, but it also exerts a distinctly beneficial effect upon the body itself. Across the body there is stretched a strong muscular membrane, called the *diaphragm*. This separates the internal organs into two sections, and the body into two parts—the thorax and the abdomen. In the chest are the lungs and the heart; in the lower portion of the trunk lie all the other organs upon which life depends. These often get torpid or inactive; the liver is sluggish; the lungs do not expand properly, because of inadequate breathing; the bowels are inactive and constipated; in fact, all the internal operations, as well as the circulation, are less energetic than they should be. What is needed is an internal massage, which sets them all working again, and stirs them into healthy activity. This is precisely what a good laugh does. It shakes and "jiggles" the diaphragm, causing it to vibrate rapidly—thus stirring all the internal organs into a prompt action. It also gives them a gentle massage, and starts the circulation into a more rapid, healthful activity. The liver is shaken out of its slothful, inert con-

dition, while the stomach and bowels are stirred and shaken, increasing the circulation of these parts, and stimulating the passage of gases and other noxious matters which may have remained longer than they should. In every way, therefore, laughter is most helpful, and should be cultivated and employed more frequently than it is. It has doubtless a distinctly beneficial effect upon the health, and serves a useful purpose (since man is the only laughing animal) by counteracting the bad effects of the enormous dinners which he eats —since man is also the only animal who cooks his food, and eats beyond the requirements of instinct!

Nature is thus shown to be wondrous kind to her children. Her ways are marvelous and most helpful, when rightly understood. Indeed, many if not all the bodily reactions may be shown to be thus beneficial when rightly understood. Let me give a few examples, which cannot fail to be of general interest.

Why Do We Scratch?

When a minute drop of poison is injected under the skin (as in the bite of a mosquito) a local irritation is set up, which we call *itching*. What

is its purpose? It is this: A greater quantity of blood is needed at this spot to carry off, into the general circulation, the poison which is deposited, doing great injury to the cells in immediate local juxtaposition to it. When distributed through the whole blood-stream, it can, however, be dealt with by the body without much damage resulting. Nature, therefore, adopts this method of producing the desired result. When the part itches, the instinct is to scratch; scratching brings more blood to the part; freer circulation is established, and the desired result attained!

Again, in a fainting spell, consciousness is abolished, and the person falls prone—the best possible position, since fainting is caused by lack of blood in the brain, and the horizontal position is the one best adapted to force the blood once more to the head. This is, therefore, a defensive reaction of nature. Many persons, when they see another in a faint, prop up the head; but this is not only undesirable, but contra-indicated by the condition involved, and has frequently proved fatal. "First aid," in such cases, consists in keeping the head *low* and the feet elevated,—if possible, at an angle,—to facilitate the return of blood to the head.

Protective Reactions

I have elsewhere spoken of the contraction of the muscles on the surface of the body in cold weather; this being a protective reaction to prevent too great a volume of blood of meeting the cold air and becoming cooled at once by contracting the blood-vessels at the periphery. A sneeze is a beautiful example of instinctive reaction, being merely an effort on the part of nature to expel, by a violent expulsive action, some irritating substance. And the same is true of vomiting, purging, and in fact practically all our bodily reactions. When rightly interpreted, they are seen to be helpful, and attempts on the part of the bodily organism to right a wrong.

Even the very construction of the body shows this, and in its most minute details. Let us take two or three examples. Thus: of what use are eyebrows, the wax in the ear, the layer of dead cells on the surface of the body—cast off débris which, one would think, had no place on the surface of a living and healthy organism?

The eyebrows, while they doubtless add to the beauty of the face, also have a distinctly helpful function. In the first place, they prevent drops of water, such as perspiration, from running down

into the eyes. Then, they give warning of approaching danger by their delicate sense of touch. This is not much exercised by us, because we no longer have use for such means of sensing the immediate presence of a physical object, likely to damage the eye; but in other animals, such as the cat, their use is very pronounced, and enable it to test the size of certain holes, before trusting the head within them, etc. The eyelashes, too, prevent tiny specks of dust from entering the eye, and shut out the too-brilliant glare of the sun. In these and other ways the hair over and around the eyes is of use.

Then, as to the wax in the ears (which is natural, and not a sign of uncleanliness, as many suppose); this also serves its allotted purpose. There are special glands in the ear, whose business it is to secrete wax, just as other glands secrete perspiration, saliva, etc. Why should they be there? For several reasons: to catch and hold small specks of dust and dirt, which would otherwise find their way into the interior of the ear, and perhaps set up serious inflammation within it; to entangle the feet and legs of insects which might find their way into the ear, and thus cause great damage to the ear-drum,

etc. Even the wax of the ear is thus found to have its uses.

A Use for Dead Cells

But what about the layer of dead cells which covers the body, the "epidermis," as it is called, which is composed entirely of worn-out and cast-off cells, and which, one would think, was of no use, except to clog and interfere with the functions of life? Even this has its great and distinct uses. In the first place, it prevents us from feeling too acutely, even painfully, every object brought in contact with the surface of the body. We know what we feel like when, for any reason, the skin is abrased or rubbed off any part of the body. It would be the same throughout, if the epidermis were removed. We should feel as if we had been "skinned alive," and life would soon become intolerable. We could wear no clothes, we could neither sit, stand nor walk; life would become impossible for us. We should either have to grow a new epidermis (as we do in case of accident) or we should die in consequence. Here, then, is one great use for the epidermis.

Another use is that, unless it were there, we should soon all be dead from infection and blood

poisoning. Bacteria swarm on the surface of the body, millions of them being present on every square inch of surface. It is because of their presence that surgical operations are dangerous. Once the skin is punctured, and the way opened for these invading microbes to find their way into the blood-stream direct, we are soon dead in consequence. Again, we all know that poison does not harm us, as a rule, unless there is a slight abrasion on the skin—unless the epidermis is punctured. If it is, we soon die. Again we see the inestimable value of this much-despised covering.

I have cited these cases only to show how even the least useful (apparently) of nature's adaptations are in reality of tremendous utility; without them, in fact, life would soon become impossible; and we learn from this, in consequence, that nature's laws are as wise as they are immutable; and that the intuitive sense of these laws (instinct) may be followed with perfect safety, so long as that instinct remains unperverted. By following instinct, therefore, we unconsciously obey the laws of nature; and in so doing, follow the laws which ensure health, happiness and longevity.

Thus, our instinct, when ill, forces us, as a rule, to refrain from solid food; we do not crave or feel that we need it. This is the instinct to fast, observed in all animals, when ill, and should be followed. Again, we experience the instinct to drink cool, pure water; to sleep, to rest or to exercise; to seek pure air; to refrain from mental work, and seek light recreation, etc. All these are instincts pure and simple toward health; and science has now discovered that they all rest upon a physiological basis, and that these instincts may, in consequence, be followed with perfect safety; in fact, to run counter to them is to endanger health and life. The anti-naturalistic teaching—which tried to prove that whatever was natural was wrong, and whatever was craved must necessarily be avoided—has now been virtually given up by all but the most bigoted: respect for Nature and her teachings has grown in proportion; and at the present day we find men of the first rank admitting that all the healing-power resides in the body, and that all we can do is to supply those conditions which facilitate to the greatest degree the manifestation of this healing power.

Nature and science are thus shown to join

hands; and science and natural religion are shown not to conflict, but to be in the closest possible agreement and contact. For both recognize the great, motive, healing power behind the universe; and in both, the more we know of the operations of that Power, the more we learn to respect and revere it.

Cleanliness

If "Cleanliness is next to godliness," it is assuredly important to keep the body, inside and outside, as clean as possible. All over the surface of the body there are thousands of minute sweat glands, which constantly pour out the perspiration, *viz.*, water, containing various organic and inorganic substances in solution. This purifies the system, but at the same time diminishes its supply of liquid, which must be made up by added water-drinking. It is one of nature's ways of cooling the body. Have you ever stopped to think that, if you drink a quart of water at (say) 45° F., and it is exuded from the body at blood heat (98.4° F.) it has soaked up, as it were, no less than 53.4° F.—which has all been abstracted from the body? When the body is hot, therefore, this must be a great and an important means of cool-

ing it; while in fever and kindred conditions, plenty of cool, pure water is one great means of saving life.

Carnivora do not perspire, for the reasons I have given elsewhere in this volume. How then do they cool themselves? They are reduced to depend upon moisture given off through the tongue, and evaporated in that manner; and for this reason we see the dog lolling out his tongue in the hot weather, and the tongue running with moisture. It seems most insufficient to us; but they do not need cooling to the same extent that we do.

Apart from the mere æsthetic side of the question, frequent bathing is necessary from the hygienic standpoint. The body is constantly giving off poisonous matter in the perspiration, and because of this the skin must be kept open and active. Persons have been known to die in a short time from blocking up the pores of the skin. Men who have been "tarred and feathered" have died in consequence. They poisoned themselves with their own excretions. Many years ago, at a dinner-party given in ancient Rome, a huge pie was served from which, when cut open, sprang a little Cupid, all covered with gold-leaf, and hold-

ing in his hands a tiny bow and arrow. It was a pretty thought; but unfortunately the poor little fellow died a few days later.

Cold Bath

Cold baths should be taken daily throughout the summer; but it is not a good plan to begin taking them in the winter time, unless the health is good. The reaction is often more harmful than the good effects received from the bath. Once accustomed to it, however, nothing could be more beneficial. A warm bath should be taken at least twice a week; and a thorough Turkish bath at least once a month. That the skin should be kept active and vigorous is most important. In the summer time, this is attended to by nature; but in the winter months we should attend to it ourselves. Inasmuch as a large quantity of poison is thus given off every day, it is obvious that the more that is given off in this manner, the less work is thrown upon the internal organs—the liver, kidneys, bowels, etc., and the purer the system in consequence.

The Salt Rub

This is a type of bath which will often be found

most invigorating and beneficial. Stand in the bath tub, and pour into the hand a heaped-up tablespoonful of sea salt. Dampen this very slightly, and then rub the body briskly all over with this salt. If one handful is exhausted, as it probably will be, use another, so that every part of the body will be rubbed in turn with the salt. Rub briskly; do not be afraid of rubbing off the skin. As soon as this is completed, rinse quickly with cool water, dry the body and slip into the clothes. A pleasurable sensation of warmth, an after-glow will be experienced, which can hardly be attained in any other way. This salt rub is a most healthful one, and might be taken once every week with advantage.

The Air Bath

Every day the skin should be exposed to the action of the air, so as to enable a free, perfect reaction to take place, and allow the skin to, as it were, *breathe*, after its confinement in clothes. In this way the skin becomes gradually hardened or toughened, as it were, and thereby is not so sensitive to draughts and cold air, which is the case when the skin is kept constantly encased in almost air-tight coverings. The skin should be

allowed to act freely and easily; and this can only be possible when the air is allowed free play on the surface of the body. It is one of the greatest energizers known.

The Sun Bath

Every day, if possible, the sun should be allowed to shine upon the surface of the body. It is a great energy-giver, and, as we now know, its powerful rays can kill bacteria of all kinds, so that this is another inducement for so doing. The surface of the body is covered with millions of bacteria; many of these cannot live in the direct sun's rays. Added to this, a peculiar energy seems to be imparted to the body by its rays, which can be experienced by one and all with immense advantage.

Cleanliness is necessary not only on the outside of the body, but inside also. *Physiological* cleanliness is the important thing, after all—far more than mere *surface* cleanliness; and many a "sweaty laborer" is far cleaner, in reality, than the society woman, who resorts to perfumes and powders to conceal the fact of her physiological sins. The tissues all over the body should be clean; and if this is to be so, the bowels must be

kept open and clean also. This should not be done by purgatives, but only by pure water and a wholesome course of life.

Most people seem to imagine that a purgative passes directly through the stomach, and into the bowels, upon which it "acts." This is not at all the case. The poison is first of all absorbed into the *entire blood stream*, which it poisons; and the body, by a defensive reaction, endeavors to expel it through the bowels, pouring out its liquids for that purpose. This is the real "action" of the purgative, as explained elsewhere; it is the reaction of the body against a drug; not the action of the drug on the body.

But these same results can be attained in a far more wholesome and sanitary manner—by means of water. Flush out the bowels; wash them thoroughly, by means of an enema, whenever indisposed; and ten chances to one the illness will be "nipped in the bud." (Details and instructions as to the enema will be found in my book, "Vitality, Fasting and Nutrition," New York, 1908, pp. 406–423.)

But all these means of regulating the bowels and restoring health for the time being are useless unless the course of life be changed, and a more

sensible régime followed. The bowels may be made perfectly sweet and clean, but the next week they would be choked up again, unless the diet were changed! That is the only way permanently to regain lost health, and keep the bowels in a healthful condition. Temporary measures are good in their way, but they are only the forerunners of a more permanent cure to follow. This depends upon the diet. If this consists largely of fruit, the bowels will be kept open naturally, and without resorting to the "drug store" on every occasion. There will be no need. In this way, internal cleanliness is assured, and good health result in consequence. There can be no doubt whatever that fatigue and exhaustion depend almost entirely upon poisons within the system. You can dispose of them only in the manner suggested.

Clothing

Most people have an idea that their clothes keep them warm, in the cold weather; and they speak of "warm clothes," etc., as if furs were really and in themselves warmer than muslins. No clothes are warmer than any others. Clothes *seem* warm in proportion to their ability to pre-

vent the escape of heat from the body. The body is all the time giving off a certain amount of heat, in the form of perspiration, evaporated moisture, etc.; and if a great amount of this is preserved, and its escape prevented, the body keeps warm in consequence. If, on the contrary, nearly all this heat is allowed to escape—owing to the thinness of the clothes, then the body cools, and the clothes appear to us "cooler" than the others. The body is cooled only because of the more or less rapid evaporation of moisture upon its surface. When a breeze springs up, and it appears cool to us, this is because the moisture on the surface of the body is being carried off more rapidly than before. The air is not really cooler than the surrounding stagnant air; it only appears cooler to us because of the fact I have mentioned. This may readily be proved by means of a thermometer. Turn on a circular electric fan, and stand in the breeze it makes. "How delightfully cool," you will say; but inanimate objects will not feel it any cooler. The thermometer will not sink the smallest fraction of a degree by being placed in the draught; nor will a bottle of water get any colder if placed in this current of air. So long as evaporation of moisture does not take place,

as in an animate body, no cooling will be experienced.[1]

So, now, we can see the relative importance of clothing. Furs are warm because they are impervious; and rubber for the same reason. The air cannot get to the skin, and cool it by evaporation. Flannel, linen, cotton, and all other goods seem warm or cool to us in proportion, and according to the extent to which they allow this evaporation to take place.

What Shall We Wear?

What, then, is the best clothing; and is any one kind better than another? The answer to these questions will bring out some very interesting and important points.

First of all, the most obvious purpose is to protect the body against the extreme cold. Man, be-

[1] I must not be misunderstood here. If an object is *hotter* than the surrounding air—for example, a hot potato—it will naturally be cooled more rapidly in a current of air than without it; because more air is brought into contact with the surface of the potato, and this air carries away the heat with greater rapidity. But it will not cool an object which is only as hot as the air itself; it will not cool a bottle of ginger ale, if it is already of the same temperature as the surrounding atmosphere.

ing an unclothed animal, must have a certain amount of artificial covering, in order to keep off the freezing blasts, which would otherwise soon overcome him. The body should also be covered *unevenly*, those parts which are the most delicate being protected the most. The spine, the neck, ankles and wrists are tender spots of this kind, and should be amply protected. Voyagers who have visited the polar regions agree that these are the parts of the body which require special protection. The hair of man is naturally long, in all probability, in order to hang down over the shoulders and protect the back of the neck. But when it is cut short, as it is in our civilized life, the back of the neck, with its delicate system of interlacing nerves, should be protected in some other way. With men, their collars afford a great deal of protection; but women often expose their necks and their backs with great freedom. The reason that more harm does not ensue from this is because we are all inclined to wrap up our bodies too completely, and render them tender and unable longer to react to the cold in a healthy fashion. Usually, it may be said, we feel the cold because the skin is anæmic, and so long as this is the case, it does not react properly, and we

feel the cold far more than we should otherwise. Have we not all of us noticed how cold we feel when we go out into the air after a hearty dinner, how we shiver and feel the cold? The reason is that the blood is all drawn from the surface of the body to the stomach and internal organs, and the skin is left anæmic. Or, try the following experiments. Undress entirely in a cold room—one in which the window is wide open. For a few moments you will feel the cold; but then the skin will react, and you will feel warm for a considerable time. But if, now, when you are glowing with warmth, you open the door, and enter the next room, which is well warmed, you will find that you begin to shiver with cold! The reason is that the reaction of the skin is suddenly checked, owing to the increased temperature; the skin ceases to react. As soon as the skin becomes anæmic or inactive, then we have the feeling and the sensation of cold.

Flannel

What is the best clothing? That is a much disputed point. Many say flannel; and an army of persons wear flannel all the year round, in the hope of escaping the ills to which the flesh is heir.

But I believe that this is fundamentally wrong. I have not worn flannel for years, and have had exceptionally good health; and the same is true of many of my friends. But better than this personal testimony is a presentation of the physiological reasons upon which the case rests. Flannel is supposed to be good partly because it absorbs the moisture of the body easily. This is true; but it is also true that it does not easily give off this moisture again. It remains in the flannel, which consequently remains moist, when in contact with the skin. In winter, therefore, when this moisture is retained, and we go out into the cold air, this is affected by the cold; and the result is that we are often colder than if we had worn something else.

This same objection applies also to cotton; which is at the same time poor material for clothing. All in all, I am persuaded that *linen* is the best substance for underclothing, to wear next the skin; and the majority of writers on hygienic subjects now favor this also. Over this should be worn only as many clothes as are necessary to keep the body warm and protected from the cold; and no restriction should, of course, take place, in any part of the body. This impedes the circula-

tion; if of the feet, it causes them to become cramped and crippled; if of the waist, it crowds and cramps all the internal organs, until many grave ills result later on in life; if of the head, the hair falls out, causing baldness, etc. Loose, simple clothes should, therefore, be worn. All this might be summarized in the following formula:

Wear loose, warm clothing, which is not air-tight; and only enough to keep the body warm when the skin is active.

We must remember that the skin can be toughened like any other part of the body, with practice. The story is told of the white man marveling at the Indian, who could walk about all the winter with next to nothing on. The Indian replied:

"Your face uncovered; it no get cold."

"No," said the traveler, "my face has grown accustomed to the cold air, because it has never been covered."

"Uh!" replied his informant; "*Indian all face!*"

Doubtless this is very largely true. At the same time, we should not overdo this, as many do. They have an idea that they should allow the surfaces of their bodies to be cold all the

winter; but this is an error. When the skin is *really* chilled, it contracts, to resist the cold, and this contraction is a great and useless expenditure of the vital forces. Physiologically, this contraction is probably due to the fact that the body in this manner prevents too large a supply of blood from reaching the skin, by contracting the blood-vessels on the surface, and hence allowing less blood to be exposed to the cold air. It is a wise provision of nature for protecting the body from the excessive cold.

Normal Temperature

This question of *the temperature of the body* brings us to one or two very interesting theoretical points. Have you ever stopped to consider why it is that the temperature of the human body always remains the same, no matter what the external temperature may be? No matter whether man lives in the tropics or in the arctic regions; whether the temperature be a hundred degrees above zero, or fifty below; the temperature of our bodies would remain the same—98.4 degrees F. Here, surely, is a wise and a wonderful provision of nature, and raises a question, the answer to which cannot fail to be of interest.

The heat of the body is thought to be produced in one very simple way. The food we eat is burned up within it, in the process of digestion, just as coal is burnt up in the steam-engine. In both cases, heat and energy are evolved. Personally, I doubt whether the heat of the body is supplied in this simple manner; but I shall assume, for our purposes, that it is, as all current physiologies state that such is the case. Heat, then, is constantly being added or supplied to the body by this process of oxidation, and, were it not for the fact that this heat is again given off, we should very soon "sizzle up" and cook, by reason of the constant internal fires going on within us.

But Nature has a wise provision; she has arranged that all warm-blood animals, such as man (cold-blooded animals assume the temperature of their environment), constantly give off heat, also—by means of perspiration, the exhaled air from the lungs, etc. In other words, there is a mechanism within the body which keeps the temperature constant; and the more heat is supplied the body, the more is given off; and the less heat is supplied, the less is given off, in consequence. Nature's books are constantly balanced, that is, so far as our animal heat is concerned.

What is this regulator, this thermometer which adjusts the temperature with such accuracy and such nicety? That is not known at present with any certainty; but it is generally thought that the nervous system is intimately involved; and that there is probably a certain center in the brain which attends to this matter. This is one of the so-called "teleological" functions of the body—a function, that is, which seeks, as though by design and consciously, to produce a certain result in a certain manner.

At all events, what stands out most prominently in all this is the simple fact that the more heat we impart to the body, the more it will be compelled to give off, in order to maintain its constant level; and hence the importance of eating, especially in summer time, only those foods which heat the body but slightly, since very little is required, at such times, to keep the body up to the temperature of the surrounding atmosphere. In winter time, of course, more food is required; and food of a different character. I need hardly say that this maintaining the body at a certain constant temperature is a power of *life;* and is only present in living bodies. As soon as a person dies, and his body becomes a "corpse," this cools

to the temperature of the surrounding atmosphere, as we all know. In fact, this is considered one of the sure signs of death.

Color

Have you ever stopped to think why Nature adopts the colors she does—why, for example, the grass, the leaves of the trees, should not be scarlet instead of green—or pink, or blue or mauve? Have you ever considered the effect of color upon the health, the mental and moral life? Why does crimson madden the bull; red stand for lust and the blood of battle; and the "scarlet lady" typify the excitement of the passions, and all that is animal and brutal in man? Assuredly color has its effects upon the individual; and that being so, it behooves us to ascertain, so far as possible, what these effects may be, and employ only those colors, —in our clothing, upon the wall-paper of our houses, our furniture, etc.,—which have a soothing and quieting effect, instead of an irritating and depressing one.

Color on an object is due to the fact that certain positions of the spectrum of light are absorbed by the object—others reflected. Our eyes react to the reflected vibrations, and perceive them *as color.*

As a matter of fact, there is, strictly speaking, no such thing as color *an und für sich* in the universe; we merely place color on the object, as it were, but it does not really exist, as a fact. This is, however, an abstruse question into which it is not necessary to enter for our present purposes. All that we need remember is that color consists of certain rates of vibration; and that we react in one way to vibrations on a certain frequency, in another way to those of another frequency, etc., as the case may be.

Now, it so happens that the vibrations at the red end of the spectrum incite, in us, qualities and feelings of a peculiar kind—feelings which are not at all aroused by the "green" vibrations.

Vibration

We are all responsive to vibrations at certain rates. Vibratory motion is, in fact, the fundamental verity of the universe; though I hesitate to use the term, because it has been so much abused in certain types of "new thought" literature. Nevertheless, everything is vibration, in the last analysis—even, probably, life. Certain of these vibrations, however, appear to us as color, others appear to us as sound, etc., while others are

never directly perceptible to us at all. There is every reason to think, therefore, that color (vibration) should play a large part in our lives; and many contend that it does.

It has been proved by numerous experiments that red has a stimulating, irritating effect upon the mental life and, by reaction, upon the body. Green, on the other hand, has a quieting, soothing effect. Browns, grays, and various drabs soothe generally; violet soothes some, irritates others. It is because of this effect of green, doubtless, that nature appears to us so restful; the trees and the grass are green of variegated shades, merging into browns and yellows; and not until the first touch of cold weather, not until the heat of the summer is over, does the first tinge of red appear. Then we can stand it. It is obvious, therefore, that nature has furnished us only with those colors which are best suited to our needs. It is a wonderful provision!

From all this the practical deduction may be drawn that it is best to have about us,—as a rule —greens, grays and browns; and especially for irritable or mercurial temperaments; the phlegmatic can stand brighter colors. Whilst a touch of color here and there will only serve to en-

lighten the surroundings, the *predominating tone* should be one of these just noted; and this applies to our clothes, our decorations, our wall-papers, etc.

All this doubtless has its effect upon the general condition of the body, and particularly the mind; and, that being so, it has its appropriate place in the philosophy of old age and in the great question of human longevity.

Climate

The climate doubtless has a certain definite effect upon some individuals—much more upon some than upon others. Some natures seem to demand high altitudes, while others like a low, flat country. Damp weather suits some; dry air others, etc. On the whole, there are many individual variations; but there are some general rules to be drawn, in spite of that.

It used to be thought that those living in the low, marshy country contracted typhoid fever, malaria, etc., because of the presence of a certain poisonous gas, a "miasma," which arose from the damp ground, and which chemists sought for in vain for many years. It has now been proved that all these diseases are due to the presence of

certain micro-organisms; and that there is no "miasma" of the sort supposed. When the germs were killed, these lands were found to be as healthy as any others. At the same time, it must be acknowledged that a higher altitude is more hygienic, and for several reasons. In the first place, there is no danger of sewage contaminating the water,—flowing into it from the surrounding country,—which is often the case in the lowlands. Then, higher altitudes are, as a rule, more stimulating, the air is less sultry, purer, and cooler. Cold air is a great antiseptic and germicide, while warm air is not. It is because of this fact that so much sickness takes place in the spring time, and the majority of persons flock to the "drug stores" and dose themselves with all kinds of "tonics," "spring medicine," etc., in the spring time. As this question of "spring sickness" is a very much misunderstood one, it may bear explaining a little more fully.

"Spring Sickness"

Throughout the winter, we eat more solid food than we do in the summer; we drink less water; we are out-of-doors less; we take less exercise; we have our windows open less; we have less

sunshine; the skin is less active,—since it does not perspire, etc. The result of this is that an added work is thrown upon the bowels—since the skin, the kidneys, and the lungs cannot perform their share of the necessary poison-elimination—owing to the insufficient perspiration, water-drinking, pure air, etc. The only reason we do not all get ill during the winter (and we all know that many *do*) is because of the antiseptic and stimulating properties of the cold air, which brace us up, and prevent sickness by their healthful action on the body. But with the first warm days of spring, this stimulant is removed. We no longer feel its sustaining and beneficial influences; while, at the same time, we have not yet received the benefits from the summer weather—activity of the skin, in perspiration, less solid food, more water, etc. The result is that we are, so to say, caught between "the devil and the deep sea"; we have the accumulation of our winter's bad living to account for—without as yet having a chance to offset it by a more wholesome summer régime, and without the stimulus of the cold air. In consequence, we become ill, and notice this trouble chiefly in the bowels, which have been overworked for so many months, because of the

under-activity of the other organs. For this reason, some of us fly to the drug store, and seek "spring medicines," etc. As a matter of fact, if we had been a little more careful of our winter's diet, and in our way of living generally, there is no reason whatever why the spring should not be as healthful a time of the year as any other—in fact, were we to reason by analogy, it should be a time of exceptional vigor and exuberant vitality.

Doctors are frequently in the habit of attributing to "the climate" many troubles which they cannot understand; and if any sickness appears to them particularly baffling or hopeless, they send their patient away to some distant clime, in the hope that they may somehow get cured there! Sometimes they do get cured; more often not. While the effects of climate may in certain cases be helpful (as, for example, in consumption) I believe that its effects have been greatly overrated, and that just as successful cures might be effected at home,—if only the physician in charge knew *how* to treat the case. When the patient's bowels are continually constipated, his lung-action insufficient, the kidneys forced to function improperly, by reason of insufficient water-drinking; and the liver abnormal, by reason of an excess of fats

and sweets in the diet—what is the use of sending a patient away to another clime, if he does not change his habits of life, if he still continues to live in the same fashion; and *as long as he carries the chief cause of his trouble with him wherever he goes?* Surely this is a makeshift, at best, and might easily be dispensed with, in nine cases out of ten, if the patient but knew how to treat himself, or the doctor knew how to treat him. While change and travel are doubtless beneficial and conducive to health, they are, in my estimation, greatly overrated as a means of regaining health, or permanently prolonging life.

Environment

Our environment doubtless has a considerable effect upon all our actions, our habits and modes of thought. In fact, some philosophers have thought that we are literally made by our environment—an exaggeration, certainly, since it fails to take into account *anything* upon which the environment reacts—the individual "self" or "ego,"—which is simply shaped by the setting in which it finds itself. But it is true that environment is responsible for much—which was previously put down to Providence or heredity—and most of all

for our habits! This is, after all, the most important influence it exerts upon us, from the individual point of view.

Habit is all powerful with us. As the Duke of Wellington is reported to have said: "Habit second nature? Habit is ten times nature!" Prof. William James, in his "Psychology," points out the importance of habit in the daily life, and the necessity of forming good habits early in life. The nervous system gets into a certain groove in this way; the mental life assumes a certain outlook, and it is just as easy (in fact, easier) to live in that manner, when once the habit has been formed, than in any other. Here is the necessity of forming good habits early in life, and training the nervous system to be our friend instead of our enemy. It can be made either, with only a little trouble at the beginning.

We are always surrounded by a certain environment. Before we are born, even, pre-natal influences affect us; and, after birth, environment is of very great importance. Every object, every mind we come into contact with, is part of our environment. It affects us and acts upon us. A bad environment will tend to engender bad habits, and will create mental and physical disease, whilst

a good, wholesome environment will have just the reverse effect. All this being so, it certainly behooves us to decide upon the best environment as soon as possible, and determine to live in it and, if needs be, create one to our liking. We can do so if we will. We can to a great extent rule our destiny. "Fate?" said Napoleon. "I *make* fate. Destiny? I *create* destiny!" There is a great truth in this. And inasmuch as this is true, we should make up our minds firmly and as early as possible, to follow a certain line of action,—to live a certain *kind* of life,—and live it, no matter what intervenes. Thus, whatever influence environment may have, it may be to some extent controlled in our favor, and will act in our behalf, instead of against us. Reform the inner man, and he will soon change his outer conditions. And the way to reform the inner man is to educate him, give him a hobby and an interest in life, an incentive to live, and teach him how to retain his health and conserve his vitality. This done, environment would in some degree be moulded by the individual, instead of moulding *him*; and our social conditions, and all else which needs readjustment, would soon be changed and reconverted into more hopeful avenues of progress.

Heredity

Doubtless we are all of us the product, to a certain extent, of our ancestors; we inherit their traits and characteristics—mental and physical. Physical peculiarities and mental eccentricities can be inherited in this manner; but this is not more wonderful than the simple facts of heredity, which take place daily, and are among the most wondrous in the whole realm of nature. What most concerns us, at present, however, is the relation of heredity to disease. It is doubtless true that a few diseases, especially blood diseases, can be acquired by heredity, and are handed down from one generation to another; but there is no evidence that disease is hereditary to the extent usually supposed. This is now generally acknowledged, and in certain cases (consumption for example) which was formerly thought to be passed on from one generation to another, it is now acknowledged that heredity plays a part in very rare cases—so few, in fact, that it is now generally said that consumption is not a hereditary disease. This has been applied to other diseases also; but some,—for example cancer,—are still thought to be hereditary, whereas, as a matter of fact, there is evidence of it in only rare cases.

The facts may be accounted for in another manner.

Let us suppose, for example, that a grandmother died of cancer at the age of fifty-five; that the mother died of cancer at the age of sixty; and that the daughter died of cancer at the age of forty-seven. Would that prove that cancer was hereditary in that family? At first sight it would appear to do so; but in reality it does not necessarily prove this at all.

For, in the first place, if cancer were hereditary, it would surely show some signs of its presence earlier in life. In those cases where certain specific blood poisons are acquired, the baby, at birth, shows signs of this, or manifests them very shortly after. A hereditary disease of this kind would hardly wait for forty or fifty or even sixty years before showing any signs of its presence! No; the indications are that, in such a case, the disease was not inherited; but that somehow it developed later on in life.

But, if this is the case, how is it that all three generations died of the same disease? If there is no heredity, no connection, why should not the daughter and the granddaughter have died of something else? Is not the fact that they did die

of the same disease a sure indication that it was hereditary?

Tendency to Disease

There is a connection, to be sure; but the disease itself is not hereditary, nevertheless. I mean just this. That, in many cases, the *tendency* to a certain disease may be transmitted to the offspring, without transmitting the actual disease itself. If the parent has consumption, weak lungs may be inherited by the child; not consumption itself, but a tendency in that direction, which may be developed in later life,—or not, as the case may be. If the parent suffers much from diseases of the throat, the child will probably inherit a weak throat, to which any bodily ills will fly, etc. It is the same throughout. The *tendency* to a disease is often inherited; the disease itself very seldom—so seldom that it may be said to be the exception, not the rule.

When this weakness in a particular spot is inherited, it may be developed or not, according to the life of the individual. If the mode of life adopted by the individual is careful and hygienic, there is virtually no danger that the disease will appear; if, on the contrary, a careless or "fast"

life be led, or even if the life be fairly careful, but the amount of food eaten be excessive (all unconsciously), then the results would follow none the less. The individual would contract the disease later on in life, as the result of the accumulation of causes, continued for many years, and expressing themselves in the weakest spot—which was that inherited. Instead of proving heredity, in such cases, therefore, we should merely have proved this:

Individuals living the same sort of life are apt to suffer the same consequences. If the daughter lives the same sort of life as the mother, she is apt to suffer in much the same way, since the same causes would be operative within her organism. In other words: *like causes, acting in successive generations, produce like effects.*

This is the law which we have therefore learned; and it is far more helpful and hopeful than that usually believed. For it teaches us that each one of us has his fate in his own hands; we are all makers of our destiny; we can create our own diseases, or, on the contrary, prevent them, according to the lives we lead. This, surely, is far more hopeful and encouraging than the doctrine usually believed—that our diseases, many of them, are in-

herited and that there is no escape for us—no matter what kind of life we may lead! It teaches us that Nature is kind; that we may depend upon her, instead of finding in her an enemy; and that, except in very rare and exceptional cases, *we bring our diseases upon ourselves*, and that they are not inflicted from without. This, surely, is a far more hopeful philosophy than that usually believed.

There is another point which is both helpful and hopeful in this connection. It is this. Every year shows us more and more clearly that no diseases are innately incurable; they can all be cured, if only we knew how. An incurable disease simply means that its cure has not yet been found. Slowly, but surely, the progress of medical science is banishing disease from the face of the earth. It is hoped that there will soon be no incurable diseases; they will all be curable; and, better still, preventable!

Further, it has been ascertained that disease is always more curable in the child than in the parent; disease grows milder and less virulent with each generation removed from the original infection. This is the rule; though there are exceptions. If, therefore, a disease is curable in the

parent, it is surely curable in the child; and this gives us ever new hope that it will, in time, be entirely removed and eradicated—even in those rare cases in which it is transmitted by heredity. This, therefore, gives us confidence in Nature; and shows us that her constant efforts are toward normality, and a clean, healthy race of human beings.

My conclusion is, therefore, that heredity, so far as it plays any part at all in the longevity of the individual and the race, is beneficial rather than harmful; toward health rather than disease; toward a longer life rather than a shorter one; toward an increased span of hale, hearty, happy years. And statistics tend to prove this.

Increase in the Average Length of Life

A little more than a hundred years ago, the average length of life, as shown by the statistics of the nation, was little more than twenty-six years. Some years ago, the average length of life was found to be slightly in excess of forty-two years; while the latest figures would seem to indicate that forty-five is a nearer estimate of the average human life. It will thus be seen that there is a distinct tendency toward lengthening life, not only of the individual but of the race, be-

cause "average" length of life means the average of the human race—so far as any particular country is concerned. It seems evident, moreover, that this tendency toward normal longevity, which has been so marked of late years, has been slowly increasing for many centuries. The Esquimaux are notoriously short-lived; while in tropical countries, where the human race doubtless started its career, both maturity and death are reached far sooner than with us in temperate climes. Thus, Arab and Hindu girls mature fully at twelve, and even earlier, and are married soon after. A boy has attained the state of manhood at fifteen. Similarly, an Arab is considered an old man at forty-five or so, and remarkably old when he has reached the age of sixty—an age at which many of our great men have but commenced their best work. Under the warmth and stimulation of the great tropical heat, life lives itself out more rapidly; it is lived faster—illustrating again the truth of Dr. Graham's remark: that a life cannot be both *in*tensive and *ex*tensive. If we live our lives fast, we cannot make them last a long time, and *vice versa*. I shall have something more to say of this in another place, so I shall not do more than refer to it here.

Excess of Light

The sunlight of the tropics has been shown to have a certain definite effect upon the human body, and when excessive a detrimental one. To a certain extent, sunlight is very beneficial, as we know; but in the tropics, as already stated, this is excessive, and becomes harmful. Dr. Woodruff, of the United States army, has written a book, showing that all nations living in the tropics tend, sooner or later, to degenerate, and he accounts in this manner for the fall of great empires—Rome, Greece, etc.,—which were founded by men from the north, but who degenerated in the excessive heat of the countries in which they settled. He also points out that blond nations become dark in course of time (witness the Greeks) as the result of this action of the sun. This is an interesting study; but is one which we can only touch upon at present, in so far as it directly concerns our central theme—the prolongation of human life. The chief thing to be learned from this is the knowledge that, if life is to be successfully prolonged, and a ripe old age reached, with full possession of the mental and physical powers, the temperate zones should be selected in which to live; and the cooler temperatures decidedly in

preference to the hotter. This is of importance to the succeeding generations, if not to the individual.

Influence of Hygiene

There are other reasons, however, for the present longevity, as compared with the shorter lives of the generations which have preceded us. In the first place, more is known of medical science —of bacteriology, *materia medica*, and the various natural methods of cure. In the next place, the great laws of hygiene are far better understood, and more followed by the people than they were before. Dietetic habits, too, are more normal and restricted than they were: it is no longer necessary for a man to get drunk to prove that he is a gentleman, as in the days of George III; excessive eating is on the decline, and even total abstainers and vegetarians are no longer looked upon as cranks and eccentric individuals to be avoided!

Then, too, the sanitary condition of the people —and especially in large cities—is a great improvement over that of a (comparatively) few years ago—of the state which even now exists in many European and Asiatic cities. Even a hundred years ago, many of the sewers were open, in a town like London, while in the smaller towns,

matters were in a shocking condition. The filth and squalor of the middle ages is generally acknowledged, and thought to be the cause of the Black Death, and many of the plagues which swept over the country like wild-fire, carrying off thousands of persons within a few weeks. Daniel Defoe's account of the "Plague of London" gives a vivid picture of the conditions of that time; and other records tally. On the whole, therefore, there are many external reasons for the increased age of man, as time has progressed; and we can fully account for the upward tendency of the average age-limit, without in any way turning to the inner man to seek an explanation of such facts.

A Better World

Yet there is evidence that this, too, has had its effect upon the bettered conditions we see. On the whole, the world has doubtless grown more altruistic than it was; it is a better world in which we live. Greater passivity of mind is possible, a more tranquil and even life. Our forefathers had to be on the lookout, constantly, for attacks from wild beasts and enemies, individual and social. They were obliged to sleep with "one eye open," for fear of attack—just as the cat does now!

They went about wearing only such clothes as they could get, in the way of skins of wild beasts; they lived in caves, lacking in ventilation, in which they built huge fires, filling them with smoke, overheating the habitation part of the time, while leaving it cold the remainder. Then, at the sudden call of alarm, they were forced to rush out, clad as they were, into the ice and snow, to battle for their lives, perhaps, against the enemy who was pursuing them.

It is small wonder that life, under such conditions, should have been shorter than it is with us, living in well-heated, electric-lighted apartments. Yet our social conditions and state of life have been but a slow growth from that just described; and it may almost be said that nearly all the improvements and comforts have been added during the latter half of the last century. Until that time, man had lived, traveled and thought almost as he did for thousands of years; but the past century has revolutionized all that. It has added solidity and tranquillity to life, and removed many of the bodily discomforts, as well as increasing our knowledge of ourselves, and how best to preserve and retain our bodily and mental vigor. Taking all this into consideration, it is small wonder that

the average span of life is to-day greater than it was several hundred years ago; and the indications are that this increase in the average length of human life will continue until a far higher average is reached than is to-day attainable.

This is the vision of the future, which all of us may possess and help to realize; and we can help to create its actuality by living the sane, clean life ourselves, and seeing that our children are brought up with these laws implanted in their minds. There is no reason whatever why all of us should not reach the age of one hundred years; and further, why this age should not be attained without any diminution of the mental or the physical powers of the individual falling away or becoming less. That is the ideal; why not cause it to become real? It is a condition which can be attained; why not attain it?

CHAPTER III

THE CAUSES OF DEATH

THERE are three great classes into which all deaths fall: death from accident, from disease, or from old age (natural death). Of these, as we have seen, deaths from old age are very rare—so rare, in fact, that several competent authorities have asserted that they do not occur at all—what we take to be "natural" death being but the end of a gradual and insidious disease, the symptoms of which have not been particularly noticeable to us. Other authorities do not share this view. Deaths due to disease are doubtless by far the most numerous, and it is from some form of disease that most of us die,—either suddenly or gradually, as the case may be. Deaths from accident are also numerous, but far less numerous than they used to be, and probably they will grow less numerous every year. All these causes of death have a certain scientific interest in themselves; and I shall first of all enumerate several of

the two former categories, reserving for later discussion old age and natural death.

We need not discuss death due to various diseases at any length, as that would make this book too medical in its tone; and most accidental deaths are also obvious in their nature. I shall speak only of some of the more "interesting" forms of death, so to say, of which the following are samples:

Death from Freezing

In this condition the body becomes gradually whiter and colder and stiffer until death supervenes. The mind, meanwhile, has long before become affected. One writer who was nearly frozen to death, and lived to tell the tale (having been rescued just in time) writes concerning it as follows:

"The bitter cold does not chill and shake a person, as in damper climates. It stealthily creeps within all defenses, and nips at the bone without warning. Riding along with busy thoughts, a quiet, pleasurable drowsiness takes possession of the body and mind, the senses grow indistinct, the thoughts wander, weird fancies come trooping about with fantastic forms, the memory fails, and,

in a confused dream of wife and home, the soul steps out into oblivion without a pang or a regret."

Death from Starvation

This does not take place until the person has been deprived of food for from one to three months—those cases which occur before are due to the mental condition, and not to physical conditions. It is a *physiological impossibility* to starve to death in less than the time specified. Starving is not the same thing as fasting. Fasting is the scientific method of ridding the system of its accumulated poisons and useless tissue; while starvation is the process by which the healthy tissues of the body are drawn upon. While one is beneficial, the other is harmful; where one ends, the other begins. For a further discussion of this topic, see my "Vitality, Fasting and Nutrition," p. 564.

When starvation does occur, however, it is doubtless one of the most terrible of deaths. The mind becomes impaired; the tissues shrink, the body wastes. The moral faculties also become blunted, as instances of cannibalism among civilized people indicate.

Death from Drowning

Many remarkable stories are told of individuals who had lost consciousness, and were afterward rescued from their watery graves. In nearly all such cases, it is asserted that remarkable flashes of memory occurred, the whole past life passing through the mind in a few seconds, like a panorama of the past actions, thoughts, etc. On its physical side, death from drowning is due to one of two chief causes: either the water enters the lungs, and is then churned up into a froth, mixing with the air they contain; or it is excluded altogether from the lungs, by the mechanical closing of the glottis, in cases of loss of consciousness from fright, etc. In the first case, recovery is very difficult; in the latter case, prompt "first aid" will nearly always effect a recovery,—provided the body has not been beneath the water for too long a time.

Death from Asphyxia or Strangulation

This presents many remarkable phenomena, the chief of which is the fact that the blood assumes a very dark hue, as described elsewhere, owing to the fact that it passes through the lungs several times without meeting with oxygen, which would

purify it. In death from shock, the heart may occasionally be stimulated into activity again by means of "cardiac massage." In numerous cases, life has been revived in this manner, even after the patient had (apparently) been dead for several minutes. Obviously, in all such cases, "death" had not really taken place; the bodily functions were merely suspended. In death from electricity and lightning, again, many extraordinary things occur. In his "Thunder and Lightning," M. Camille Flammarion has narrated a number of cases which came under his own observation. In one instance, the clothes were torn off the body, and hung up in a near-by tree, leaving the individual standing without a shred of clothing, but otherwise quite unhurt. In another case, the clothes were ripped off in like manner and thrown a great distance. In one case, the lightning set fire to a man, and he burnt like a sheaf of wheat; in another, it burnt both his hands to a cinder, but he was otherwise untouched. In yet another remarkable case, lightning struck a man, and yet he presented none of the signs of having been hit by the lightning; but, however, one of his companions having placed his hand on his shoulder, he crumbled to dust before him. These and many

other equally remarkable instances might be cited, did space permit. There is no limit or end to the freaks which nature plays in this direction. Death from lightning is dreaded by man; but it should not be, for, as a rule, if lightning struck a person, death would be so sudden that consciousness would not have time to appreciate the fact that anything had happened. It would be abolished before it was aware of the fact!

Death from Spontaneous Combustion

This is not believed in these days, though it was some years ago, and we all remember that Charles Dickens made one of his characters die in this rather dreadful fashion.

Death from Poison

This differs greatly, according to the poison taken; but most of them are more or less painful and protracted. *Mental action* may cause death; and many cases are on record in which this has occurred. Fear, anger and even great joy have been known to kill. All such cases illustrate, to a remarkable degree, the power of the mind over the body.

Sudden Death

As to *sudden death*, there are many varieties of this, rupture of some of the great blood-vessels being among the most common. There are also ruptures of the great nerve-trunks, lesions of the respiratory system, of the digestive system, etc. Death by "accident" comes under this head.

It will be observed that, while the majority of the former deaths are accidental in nature (or intentional, in the case of suicide) the latter are due to the sudden giving way of some part of the bodily organism; and hence the question may very naturally arise—how to prevent these deaths? Is there no way in which we can escape this sudden ending of life, all unbidden and undesired?

Sudden death may doubtless be prevented, in the majority of cases.

All such deaths are due, in reality, to the sudden and fatal *termination* of a long standing *disease*,—the symptoms of which have escaped the careless observer. Strictly speaking, such a thing as sudden death, not from accident, is almost impossible,—such is at least the verdict of some of our most competent medical authorities. The cause or causes of death are always upon investigation to be found in the system.

Now as to the means. How are we to prevent ourselves from being as it were "snuffed out" in this manner? Surely by following the laws of health, and living "the simple life." In no other manner can such a death be avoided; and no other precaution is needed for its prevention.

Let us take a case of rupture of the aorta—one of the most common causes of sudden deaths. This is due to the fact that, at a particular moment, an added strain is thrown upon the walls of the artery, which curves, just as it leaves the heart; and its walls, having become brittle and thin, are unable to stand the strain. It gives way or snaps, and death is the result.

There are two ways of avoiding such a result, the *palliative*, and the *preventative*.

In the former, the patient is ordered to undergo no strain which is liable to throw an added strain upon the too-brittle artery walls. For this reason, the patient is forbidden to climb stairs, lift heavy weights, bend down too frequently, take violent exercise, become excited or angry, etc. When any of these things are done, the heart is compelled to beat faster, more blood is forced upward with each stroke, and at last one stroke finally bursts the artery. Or, if this does not result, the

sufferer feels obliged to resort constantly to nitroglycerine or other heart-stimulants, in order to ward off the immediate danger. The patient is sometimes recommended to eat no meat and drink no stimulants—sound advice—but advice which is rarely given.

Prevention

It will be observed that all these aids are means of preventing the sudden and fatal development of a condition once developed. As such, they are assuredly helpful; in fact upon them the sufferer's life depends; but the most wise and sensible way would surely be so to live as to *prevent* any such condition developing in the first place. That would be far more in line with true hygiene and common sense. And such measures are not difficult to prescribe in the majority of cases.

As we have seen in several places in this book, it is the *diet*, chiefly, which is the cause of premature induration and ossification of the arteries and tissues generally. It is upon *its* character that the suppleness of the body depends. If, therefore, the diet consists largely of fruits with an admixture of other simple foods, eaten in moderation, there is no reason why such conditions should en-

sue—and in fact they would not ensue. They only come about because of years of abuse of the body—eating too much at each meal, and too many times a day for years; inharmonious, unsuitable and bad combinations of food, too little water-drinking, etc. As a result, a dangerous condition of the arteries is brought about and is hastened by lack of exercise, insufficient breathing, cramped bodily positions, etc. A further factor of old age is the wear and tear upon the heart which our methods of life entail. The meat eater's heart beats from ten to twelve times a minute more rapidly than that of the man who does not eat meat—alone a great and unnecessary strain upon that organ. Stimulants have the same effect. Intense or concentrated intellectual work, emotional states and passions, etc., cause the heart to beat, at times, at an alarming rate. All this has a tendency to wear out the bodily organism before its due time, and bring on a condition of the body which renders sudden death an easy matter; whereas a healthy condition, induced by years of living in accordance with the laws of nature, will reduce this danger to a minimum. The only sure remedy is a more hygienic, simpler mode of life; and above all a simpler diet, for

this, adopted early in life, and more or less consistently followed, will insure the safety of the individual against sudden death of the character indicated.[1]

City or Country

As we are discussing this question of heart stimulation and its relation to old age, it may be well to refer here to a theory of old age which has been advanced—finding some supporters among writers on these subjects. It is that we grow old and die because worn out by the sensory stimuli which are constantly poured into the body, *via* the brain and nervous system. The stimuli, in other words, literally wear *us* out; those who receive the greatest number of stimuli being the first to wear out and die, etc.

This theory is, unfortunately, disproved by the facts. For, were it true, the man who lives in the country ought to reach a greater age, on the average, than the man who lives in the city; whereas this is not the case. In fact, statistics seem to indicate that the average length of life of the farmer is

[1] Except, of course, where serious organic trouble exists; but even in these cases, patients have often lived for years and years,—until quite old age, in fact,—and then died from another disease altogether!

lower than that of the city man ; so that his life is shorter, as a rule. This fact, therefore, refutes the theory which is thus shown to be untrue.

It may be asked why this should be the case—since the man living in the country assuredly ought to be more healthy than the city man : he has purer air, a quieter and more peaceful life, etc. Why should he die sooner ?

I believe this is due to four chief reasons. In the *first* place, many farmers close their windows at night, and shut out the night air. They are thus worse off than their city brethren who sleep with them open. In the *second* place, they constantly overload their systems with food : the majority of farmers eat far more than they should—even as working men. In the *third* place, their water supply is often bad ; while sanitary and medical arrangements are certainly inferior to those in the city. In the *fourth* place, they use their minds less ; and, contrary to general belief, I am persuaded that concentration of mind and intellectual work, so far from wearing out the body and the brain, strengthens it, and enables us to get a better "grip" of life, as it were,—which stands us in good stead, when the time comes for its employment.

Effect of Mental Work

I do not wish to be misunderstood here. Of course, everything may be abused; and the intellect may assuredly be overstrained. But I believe that mental work does not, as a rule, exhaust in the manner usually supposed, provided the food be properly regulated. Several years ago, Dr. T. L. Nichols, of London—a well-known physician and writer upon dietetic subjects—made a number of experiments upon himself—in his endeavor to ascertain the best diet for prolonged mental work. As the result of his experiments, he found that eight or ten ounces of food a day was the best for constant brain work: all the energy of the body was free to flow to the brain, none of it being demanded in the stomach or other internal organs. The practical conclusion is that a very small amount of food is best for brain work; and on the contrary, brain work is not that which wears us out; it is our habits of life, which so exhaust the bodily energies that scarcely any are left for mental work.

* * * * * *

Dr. Arnold Lorand, of Carlsbad, has lately advanced a theory of old age which has created con-

siderable attention. In his book, "Old Age Deferred," which has been in great demand, he states his theory, which is, briefly, this:

Glandular Changes

We all grow old and die because of the degeneration of the ductless glands in the body. All vital phenomena, he says, are under the control of the action of these glands; everything depends upon their condition. Symptoms of old age appear after changes in these glands. The appearance, the condition of the tissues, all depend upon their condition. Depressing emotions are perhaps the most fatal and certain of all means of breaking down these organs, and insuring premature old age and death. He says in part:

"The symptoms of old age are the result of breakdown of the tissues and organs which, owing to shrinkage of the blood-vessels, are insufficiently supplied with blood, and, owing to the disappearance of nervous elements, are devoid of proper nervous control.

"Degeneration of the ductless glands and of the organs and tissues cannot be simultaneous, for the latter are under the control of the former. These glands govern the process of metabolism

and nutrition of the tissues, and by their incessant antitoxic action protect the organism from the numerous poisonous products. . . . After degeneration of these glands, the processes of metabolism in the tissues are diminished, and there is an increase of fibrous tissue at the expense of more highly differentiated structures.

"The fact that the changes in the tissues are secondary, and take place only after primary changes in the ductless glands, is best proved by the circumstances that they can be produced, either experimentally, by the extirpation of certain of the ductless glands, or spontaneously by the degeneration of these glands in disease.

Broken Laws

"It is evident from the above considerations that all hygienic errors, be they errors of diet or any kind of excess, will bring about their own punishment; and that premature old age, or a shortened life, will be the result. In fact, it is mainly our own fault if we become senile at sixty or seventy, and die before ninety or a hundred."

This, it will be observed, bears out what has been repeatedly said in the present volume, both as to the normal age-limit, and also the fact that

we have it within our own power, either to prolong life or shorten it, according to the mode of life we lead.

The great question is, of course, How to prevent the premature degeneration of these glands? This is a question which it is all-important to answer.

In general, it may be said that all those hygienic agencies which tend toward health prevent this degeneration, while, on the contrary, all those which tend to exhaust and prematurely wear out the vital economy bring about this result. The advice given in this book is, therefore, that which will best prevent the premature degeneration of these parts; so that, even were the theory proved true beyond all question, the truth would still remain: that a careful, hygienic life is that best adapted to prevent such a misfortune, and to gracefully prolong life.

Begin Now!

It seems all very well to be prodigal of our forces when we are young, and do not notice their premature exhaustion; it is later on in life that we notice these premature excesses. As a friend of mine once graphically expressed it: "At fifty,

most people are like a piece of old rubber hose;" and it is then too late, as a rule, to begin the work of regeneration. It is too late! "*Now* is the appointed time;" it is impossible to begin too young! At the same time, there are certain cases in which the individual has completely rejuvenated himself late in life, and after years of excess. Such a case is that of Louis Cornaro, the celebrated Italian nobleman, who, at forty, found himself in the unwished-for condition mentioned above; but determined to reform completely, and begin life anew. He thenceforward lived what he called "the sober life"; he limited his food to twelve ounces a day, fourteen ounces of wine (light Italian wine); and lived a wonderfully active, happy life to the age of one hundred and two. At ninety-four, he began to write his book, which he finished in four installments, the final one being completed in the last year of his life. It is written in a remarkably clear, forceful manner, showing that his mind was keen and alert at that period. He warmly defends, in his book, "The Art of Living Long," the course of life followed by him; and tells us, in the most interesting manner, how, when more than ninety, he was induced by his relatives, contrary to his own judgment, to

increase his food supply slightly. The result was a high fever, which he dispelled only by once more returning to his original abstemious diet.

This is a most helpful case (it is classical, in fact) and enables us to perceive how outraged nature responds to rational treatment, even after years of abuse. It is most hopeful and encouraging in this respect.

At the same time, we must acknowledge that all are not so fortunate. Many fall by the wayside in attempting to follow the example set by their tougher colleagues. We rarely hear of such cases—though they are numerous. Usually we hear of the old man who has lived to be ninety-three, and drank and smoked all his life! The very fact that they are made so much of, when found, proves their rarity. They represent the *exception;* not the rule. For one man who attains old age in this manner, thousands die; and of these we hear nothing. To any one who looks at the facts impartially, it is obvious that these rare cases prove nothing: and that they are merely held to our attention by those who desire to live their lives as they see fit,—unmolested by thoughts of hygiene and such "nuisances," and who hold up these examples to us as a means of poking fun

at those who take life seriously enough to wish for its prolongation, and who have sufficient foresight to provide in time for effects which are bound to follow otherwise from a wrong course of living.

"A Short Life and a Merry One"

We often hear, in this connection, that people do not want to "bother" so much about their health; they prefer to take life as it comes. In fact, "a short life and a merry one" is their motto. This philosophy would be all right if it really accomplished what it sought, if it really attained the desired result. But it does not! As Dr. Oswald remarked: "Merry indeed! That is a grim jest. What of the headaches and lassitude, the sour stomach and sourer thoughts which follow in consequence?" And, one might add, what of the days and weeks in bed; and often of the lives prematurely snuffed out as a result of a few months' riotous living? We afterward have plenty of time to regret our actions! As one clever writer on these subjects remarked:

(This year) "I can eat anything; nothing bothers me."

(Next year) "I can't eat anything; everything disagrees with me!"

In fact, it resolves itself into the old problem: *Is the game worth the candle?* Are the few days' or even hours' amusement worth the price we afterward have to pay for them? Various natures will doubtless answer this question in their own way. There are some who would decide in the affirmative; and, in particular, we can hardly expect youth to exercise great discretion in this direction. As the old Romans said: *Quot homines; tot sententiæ*—there are as many opinions as there are men. Doubtless this is true here, as elsewhere.

Is the Game Worth the Candle?

At the same time, it is also true that the game is *not* worth the candle, in the majority of cases. The after-effects of our actions are too great and too heavy to be in proportion to the act itself. The sane, clean, hygienic life is the only one which, as a matter of fact, gives lasting satisfaction to one who lives it. That is to say for *most* of the time. We are all of us entitled, now and then, to what Professor James so happily called "a moral holiday." It is a great vent and outlet

to the nature, which otherwise would get "set" and "groovy" in its ways. Make the daily life sane and wholesome; and an occasional indulgence will not harm you. There are natures which never crave these occasional "sprees." So much the better for them. But the majority do—especially at first—and their indulgence will do less harm than the continual forcing of the nature into grooves which are contrary to its cravings and desires.

Natural Death

Inasmuch as the body is a machine which, as Professor Schiller says, "has somehow learned to repair itself," it is a wonder that it should ever wear out at all; and the question is, why it does. Certainly very few do; nearly all persons die prematurely, as we have seen. But such facts should not blind us to the theoretical possibility—that man does or at least can grow old and die naturally. Few would doubt that; the question is, why? Many theories have been advanced in the past as an explanation of natural death; but hardly any of them can be considered satisfactory. Many of them, when examined, are found to be simply a statement of death from some form of

disease. Again, many forms of the definition seem to assume the whole question; as that of Mr. Conn: "Death . . . is simply the destruction of protoplasm, which would of course destroy its properties." This may be very true, but why should this destruction, so calmly assumed, take place? That is the question. Spencer defined life as the "continued adjustment of internal relations to external relations" and death as the cessation of this adjustment; but again it will be seen that this does little more than *state* the case, without in any way *solving* it. And the same may be said of the majority of definitions which have been advanced in the past.

Two theories of death have been put forward of late years, which attempt to answer the question, and which, at least, meet these objections squarely. One is that of my friend Mr. John R. Meader ("Graham Hood"); the other is that of the present author. I shall state them both very briefly.

One Theory of Death

Mr. Meader's theory is as follows: Because countless generations of mankind have kept one thought, one fear, before their minds, they have

implanted it so deeply in the subconscious self that it has formed a veritable part of their being. This fear is the thought of death at a particular time—at about seventy or eighty years of age. Every one subconsciously expects to die at about that age, and somehow sets that as his "mark" at which he naturally expects to die. This thought, this fear, is handed on from one generation to another, partly by heredity, partly by unconscious suggestion, until our children, in turn, grow to think that they, also, must die at about that age; and this thought, working as an undercurrent, as a powerful suggestion, through life, ultimately brings about its own fulfilment,—as all such suggestions do,—which are powerful enough, and frequent enough. Thus we die because we have thought ourselves into dying; the natural all-but-immortality of the body is terminated in this manner—aided, no doubt, by years of living contrary to nature's laws. Thus, in a sense, natural death is *a habit*, due to suggestion; which mankind will probably outgrow,—to a certain extent,—though it may not do so.

There is doubtless a truth in this theory, though it may be questioned whether it accounts fully for all the facts. The argument, however,

based upon the contention that plants and the lower animals die (in spite of the fact that we cannot reasonably attribute to them mental influences, as in the case of man), Mr. Meader answers by pointing out that, as their mode of life is very different, and as mental evolution plays such an insignificant part in their lives,—as compared with ourselves,—it is probable that their mode of death is also different; and this would account for the possible difference in the kind of death in the two classes.

Death Defined

My own theory of death is as follows: Before we can adequately define death, we must define life,—since death may be defined (biologically) as the cessation of life. Of the innermost nature of life we are, of course, ignorant; but we may, perhaps, give a definition of its character, or mode of manifestation to us, in the material world.

It seems probable, from what we know of other manifestations of energy, that life is a species of molecular activity—a constant and rapid to-and-fro motion of the material substratum of life—the protoplasm. This may be due to forces moving or instigating this activity—and, of course,

like all forces, invisible and intangible. The rate and character of this action, or vibration, depends upon the degree of activity of life; it fluctuates and varies, as the power of life grows more intense or wanes; as it more fully controls the organism, or is shut off from such complete manifestation by the condition of the body at the time. Thus, the power of life may be supposed to exercise a variable and fluctuating influence over the body—at times manifesting fully, as in intense conscious effort; at times unable to influence it as it should—owing to the poisoned and obstructed condition of the nervous system and the tissues; at times, perhaps, enabled to exercise preternormal powers and functions; at other times, maintaining only a loose and formal connection, as in sleep, or becoming severed altogether, as in death. This vital energy, this power of life, probably acts more or less indirectly upon the nervous system, through some semi-etheric intermediary.

The manifestation of life, therefore, might be defined, roughly, as a species of *vibration*. A certain rate of vibration would correspond to the normal standard of life; above or below this would insure certain bodily and mental perturbations. But if raised very much above or lowered

very much below this normal limit, it would be impossible for life to manifest at all; and death would then take place. I thus, therefore, define natural death, or death due to old age:

"It is the inability of the life force to raise to the requisite rate of vibration the nervous tissue upon which it acts—its manifestation thus being rendered impossible."

In this manner we could account for all manner of deaths—death from old age, sudden death, accident, disease, etc. Life, on such a theory, would be unable to set the mechanism of the body in motion; it could no longer manifest to us; hence, so far as we could see, it would have become extinct—though not necessarily so, since it might continue on another plane of activity—not *as vibration*, but as the power or energy which set the molecules of the protoplasm into vibratory activity.[1]

Were such a theory true, it would at least enable us to form some mental picture of the proc-

[1] It may be objected that I have not *proved* this theory of life to be true, and upon its correctness the theory of death depends. No, it is not proved; but neither is any other theory of life; but it has in its support many analogies and facts which might be said to tell in its favor.

ess and the causes of death. It enables us, also, to propose the question: What is to be done to postpone death, and prevent it from taking place?

Again we are driven back to the same answer which has been returned whenever this question has been raised. For it will be seen that the fault does not lie with the life force itself, but in the clogged and obstipated condition of the tissues and cells which prevent its proper activity—which render it impossible for the life force to set their substance in motion. And this is because they have grown so hard and lacking in fluidity, and ossified, etc., that it is impossible. And this condition, in turn, is due to the habits and modes of life, and particularly the food habits, which brought such a state to pass. From any point of view, therefore, we reach the same conclusion: *viz.*, that our only salvation lies in following the simple, hygienic life, and by following the laws of nature, in respect to what we do, eat, drink and think! Only by doing so can this condition be prevented, and death postponed. Only by doing so can life be lengthened, old age defeated, and longevity attained!

CHAPTER IV

THE SIGNS OF OLD AGE

THE general signs of old age are so well known that they need not be described in a book of this character. All are familiar with the sight of an old man or an old woman, with their scant hair, their shriveled skin, their stooping figure and their childlike mentality. The question is: What causes this condition of old age? Is it a natural condition, or is it the result of the artificial conditions of our civilization? What are the changes which take place in the body, rendering such conditions possible? Why should people ever age before they die? And, finally, what are the changes themselves which are associated with this condition? These are questions which must all be answered before we can ask ourselves the final one: Can they be postponed or prevented with any hope of success?

The causes of old age are doubtless numerous, and depend largely upon the kind of life lived by the individual. Men who work indoors age in a

different manner from those who spend their lives out-of-doors; and various professions each have their peculiar effects. We have noted that those who live in the tropics age more rapidly than those who live in temperate climates; but in the very cold of the arctic regions, life is also short. Diet has a great effect upon old age, as we have already seen,—and so have the drinks used, the amount of sleep indulged in, the kind of life lived —whether quiet and peaceful, or exciting and full of emotional and intellectual activity. Years ago, Dr. Graham formulated the law that: "A life cannot be both extensive and intensive"—it can hardly last a great many years, into ripe old age, if it is filled with passion and excitement. And yet men of this character often seem to live as long as others who do not! The reason for this is twofold. In the first place, these men have a more than usually strong vital constitution, and can withstand the "pace" on that account. Hundreds fall by the wayside in an attempt to imitate them; and of them we hear nothing. On the other hand, riotous living is almost as common with other men as with them; and as I believe the food to have a greater influence than anything else, this will account for the death, at about the

same age, of most people—all of whom overeat to very much the same extent.

Is Old Age Natural?

When we ask ourselves the question: Is this condition natural? we must reply both "yes" and "no." Our dogs and other domestic animals show signs of old age, just as human beings do. Their hair becomes gray; they lose their teeth, etc. On the other hand, very few wild animals show similar signs of old age. To this extent, therefore, old age is unnatural and an acquired characteristic; but we must remember that few wild animals have the chance to live out their allotted span; they die of disease, are killed by other animals, etc., so that we have few opportunities of studying wild animals which have grown old. On the whole, it seems true that all animals show signs of old age, but in a varying degree; in man most of all—in an abnormal degree—and this is doubtless due to his abnormal modes of living, and particularly his food habits.

When, now, we come to inquire into the actual conditions of old age—the changes which have gone to make it—we are on far more solid ground, for these have been studied by a number of scien-

tific men, and many of them are now pretty well understood. I quote from a former book, "Death: Its Causes and Phenomena" (pp. 137–142), as follows:

"The most marked feature in old age is a fibrinous, gelatinous, and earthy deposit which has taken place in the system—the latter being chiefly composed of phosphate and carbonate of lime, with small quantities of sulphate of lime, magnesia, and traces of other earths. The accumulation of these solids in the system is doubtless one of the chief causes of ossification, leading to premature old age, and natural death. In the *bones*, this is most noticeable. The amount of animal matter in the bones decreases with age, while the amount of mineral matter increases. This is especially marked in the long bones, and the bones of the head. They thus clearly show us that a gradual process of ossification is going on throughout life.

Physical Changes

"As age advances, the *muscles* diminish in bulk, the fibers grow more rigid and less contractile, becoming paler and even yellowish in

color, and are not influenced by stimuli to the same extent as in youth. *Tendons* also become ossified to a certain extent, while there is a diminution of the fluid in the sheaths of the tendons. The *brain* increases in size, up to about forty years of age, when it reaches its maximum weight. After this period, there is a gradual and slow diminution in weight of about one ounce in every ten years. According to Cazanvieilh, 'the longitudinal diameter of the brain of an old man, compared with that of a young man, is six inches, one line, French measure, for the former; and six inches, four lines, for the latter; while the transverse diameter is four inches, ten lines in the old man, and five inches in the young man.' The convolutions of the brain, also, become less distinct and prominent.

"The *dura mater* is often found apparently collapsed or corrugated. It is thickened and indurated, and ossific deposits on the arachnoid surface are very common. The membrane is sometimes found to have an abnormal dryness; the arteries supplying the brain have, in old age, become thickened and lessened in caliber; the supply of blood thus becomes less and less, leading to the mental imbecility of the aged. This gradual

process of degeneration in the arteries, not only in the brain but throughout the body, is well recognized, and is perhaps one of the most important of all the changes which take place in old age. So important a symptom is it considered, that it has given rise to the old saying that: 'A man is as old as his arteries.' The capillaries also become choked or blocked up, as the result of the earthy matter accumulated in the system.

"These changes taking place in the arteries, greater pressure is thrown upon the *veins*, which dilate, their coats becoming thinner, and they even become tortuous and varicose.

"The gradual process of induration and hardening, going on throughout the system, is noticeable also in the *heart*,—giving rise to various affections known to us under a variety of symptoms. The *lungs* gradually lose their elasticity and increase in density. The air cells and bronchi become dilated —hence emphysema, and chronic bronchitis are so often seen in the aged.

Changes in the Organs

"The *salivary glands* become hardened and decrease in bulk. The saliva is either secreted in large quantities, so that dribbling takes place, or in

quantities so small that the mouth is hardly moistened. These changes are probably due in part, also, to lack of central inhibition.

"In the *stomach*, the gastric juice is secreted also in diluted form, and is deficient in pepsin; moreover the muscular walls of the stomach gradually lose their wonted contractibility; the peristaltic motion becomes weak; chyme is imperfectly manufactured, and all the processes of digestion weakly performed.

"The *liver* shows the effect of old age by its imperfect bile-forming qualities. Fatty matters are not thoroughly emulsified, or absorbed by the lacteals—though this may be due to an alteration in the secretion in the pancreas.

"In the *intestines*, the small vessels which supply the follicles and various glands become indurated, or even clogged up, in old age. The walls of the intestines become opaque, and lose their contractibility, while the 'villi' containing the lacteals undergo the same gradual alteration. It will be seen from the above how necessary it is that all food should be restricted in quantity and simplified in quality, in old age! All the viscera, and particularly those glands and organs connected with the sexual apparatus, show signs of

old age. The walls and structures become harder in texture and less pliable.

"In the *eye*, in old age, there is diminished secretion of the aqueous fluid, in the anterior chamber. The cornea becomes less prominent, the pupil becomes more dilated from lessened nervous sensibility—hence distant sight and the indistinct and confused view of near objects in the aged. Cooper states that the retina, in old age, is found 'thickened, opaque, spotted, buff-colored, tough, and in some cases even ossified.' Quain called attention to the fact that the color, density and transparency of the lens presented marked differences in different periods of life. In old age, it becomes flattened on both surfaces, and assumes a yellowish or amber tinge. It loses its transparency, and gradually increases in toughness and specific gravity. Cataract is rarely found in the young; frequently in the aged.

"The *ear* is subject to the same gradual process of ossification. The cartilages of the external ear become hardened and even ossified; the glands which secrete the ear wax undergo the same alterations as are found in other glands. The secretion becomes less, and altered in quality. The *membrana tympani* becomes thickened and

indurated; the ligaments connecting the ossicles (malleus, incus and stapes) become hardened, and their pliability is lessened; thus vibrations which are already imperfect, owing to induration of the *membrana tympani*, are improperly converted by the ossicles across the cavity of the tympanum, by means of the internal ear (the structure and fluids of which have undergone the same processes of consolidation), to the auditory nerve, the sensibility of which decreases with the senile changes of the brain. Hence the impaired and confused hearing in aged persons.

"The whole membrane covering the *tongue* becomes thickened and hardened in old age: its surface becomes dry and furrowed, while the blood-vessels supplying the villi are decreased, hence the sense of taste is diminished.

Weakened Senses

"In old age, the sense of *smell* is lessened, owing to the hardening of the membranes and internal cartilages; moreover the fibers of the olfactory nerves lose their susceptibility.

"The sense of *touch* throughout the body is greatly diminished: this for several reasons. The sensibility of the nerves is lowered as well as the

reactions of the senses. The epidermis becomes thickened, and less sensitive. The capillaries supplying the papillæ are also lessened in caliber; the action of the various sebaceous glands is also diminished; the skin becomes dry, shrunken and leather-like. It thus has a cracked and furrowed appearance, and has a tendency to pucker up. Hence the wrinkles of old persons. In old age the skin contains more earthy salts than in youth.

"As is well known, the *teeth* are almost invariably lost before age is far advanced—this being due partly to external causes, partly to the lessening and corrupting of the blood supply upon which the nutrition of the teeth depends. As a result, they decay and fall out.

"The *hair* is generally lost, and usually becomes white. The cause of this for a long time puzzled physiologists, but it is now somewhat conclusively shown that this blanching of the hair is due to the action of certain micro-organisms, which devour the coloring matter. Of course, the question still remains, what is that condition of the body which renders possible the presence of these micro-organisms—which certainly do not exist so long as health is maintained? It would seem to us that *this* is more truly the cause of old age. . . .

Metchnikoff's theory of the blanching of the hair fails to account for certain facts, however, such as the complete whitening of the hair, over night, as the result of purely nervous shock."

The Stock of Vitality

In old age the stock of *vitality* is decreased, but whether this is due to the state of the blood or of the tissues, or both; or whether the state of the blood and the tissues depend upon the amount of vitality; and whether this vitality can be replenished as life advances, and if so, how; or whether a certain fund of life is inherent in every living organism at birth—which no skill of man can add to—all these are questions which we shall now discuss as briefly as possible.

It is very easy to see that we can get into what is called a "vicious circle" when discussing these questions. Like a snake swallowing its own tail, there is no end; we go round and round in a circle without arriving at any profitable conclusion. For, if it be argued that the amount of vitality depends upon the state of the body, it is equally true that the state of the body depends upon the amount of vitality; so that these two might eat each other up to all eternity. This is a difficult

question which it would take too long to settle here; and I merely refer the interested reader to my book, "Vitality, Fasting and Nutrition;" where he may find much to interest him upon the subject. Here, we shall simply take it for granted that such dependence *exists*; and proceed to take it for granted without further dispute.

There remains the question, whether we each of us possess a certain definite fund of vitality at birth, to which we can never add but simply "live out," like a clock running down; or whether we can add to it or replenish it, with age. It is evident that these are very important questions, since, if the simile of the clock were true, we could never prolong our lives beyond a certain span, however hard we tried, while if the other theory were true, we could greatly increase the length of our lives by carefully conserving this vital supply, and by expending it wisely. Which theory is true?

If the original-stock-of-energy theory were true, it would be hard to account for a case such as the following. Suppose a man, at birth, were "wound up" for seventy years, so to say. At twenty, he contracts diphtheria. If he died, that might be accounted for on this theory, because it does not say that a man cannot be killed beforehand, by

accident or disease. But suppose this man lingers on and on, and the illness extends over several weeks; then he recovers. At the end of that time, he is completely worn out and emaciated. There is hardly enough vitality in his body to enable him to live from day to day. Yet he finally recovers, and after that lives on for fifty more years.

Can we suppose, in such a case, that there was enough vitality left in the cells of this man's body to enable him to live for fifty years upon it, when he was hardly enabled to live from day to day? Assuredly not! Then this theory cannot be said to "hold water." It must, therefore, be erroneous, and the contrary theory true.

It may be thought that all this theoretical discussion is out of place in a practical little handbook such as this; but I do not think so. The object-lesson we should gather from this is that our stock of energy depends upon ourselves; we alone are masters of our own destiny, to this extent, and we do not depend upon any external power to help us. If we live wisely, we can certainly prolong our lives, and make them healthier and happier; on the contrary if we squander our energies, we cut short our lives, and to some extent

fill what life we do have with sickness and disease.

Hardening of the Tissues

I have just shown one very important set of symptoms and conditions of old age to be the earthy deposits which take place throughout the body, lessening the amount of animal matter, and increasing the percentage of earthy salts. Of this ossification and induration we have seen the effects—the various organs and tissues being more or less choked and blocked by the solid material. This being so, the question arises: How prevent its accumulation? There is only one possible way in which it can get into the body, normally; and that is through the food and drink. In no other way can solid material enter the blood stream. It may readily be seen, therefore, that either more or less of this material may find its way into the circulation, according to the quality and quantity of the food we eat. Certain foods contain more than others; and if we desire to prolong life, and prevent this premature induration and ossification, we should most certainly eat only those foods which contain as small a percentage as possible. What are these?

It is generally conceded that starches are great producers of this condition. An excessive quantity of bread-stuffs is sure to induce this condition sooner or later. Starchy vegetables have the same effect. Meats, by creating toxins in the body, act in a different manner; but are essentially deficient in certain salts which the body needs. Fruits contain these salts in abundance,—as before said; also a quantity of water in pure form, and almost no elements which would create these conditions, because they contain practically no earthy salts of the character that would block the system, and cause the condition known to us as old age. At the present day, many scientific men unite in saying that fruits are real foods, and not mere food-accessories. Besides this, fruits contain a certain "electrical vitality," as it were, which is not contained in other foods, but which give a species of energy to the body, which no other foods can. It must be remembered, also, that fruits are mostly eaten raw; and food is often, if not always, spoiled in the cooking to a greater or lesser degree. Starches are the great exception to this rule;—because, as before explained, starches are partially converted into dextrine in the process of cooking, hence a part of diges-

tion artificially accomplished. But this is different from what is usually meant by cooking, and in the case of vegetables, meats, etc., much of the goodness of the food is extracted in the process, and boiled out into the water, where it remains in a state of suspension, while what remains behind is, as it were, a simple "skeleton," without nutriment or benefit of any real worth. Raw foods contain, for this reason, more nutriment to the same *bulk* than do cooked foods; and so the quite erroneous idea, that cooked foods are far more "nourishing," is shown to be untrue; in fact, the very reverse of this is the truth.

CHAPTER V

PHENOMENA OF DEATH

WHEN a body has apparently died, the question arises: Is it really dead, or is it simply in some trance-like condition, which simply resembles death? We know that trances of the kind *do* supervene, at times. How can we tell whether a body is really dead, or whether it only appears to be so?

There are many indications, of which the following are the most important: Intelligence is absent; insensibility is complete; various odd phenomena take place in the eye; respiration ceases; the circulation (heart-beat) stops; the temperature falls; the skin assumes a parchment-like appearance; the skin does not as a rule blister; the lower jaw drops; the skin becomes discolored; the blood fails to coagulate; the body is said to be more pervious to electrical vibrations; a peculiar odor is often noticed; *rigor mortis* (rigidity) sets in; and finally putrefactive decomposition supervenes. This last is a sure sign of

death; all the others, taken singly, are fallible. A *combination* of all these signs, however, is doubtless more or less conclusive.[1] Sir Benjamin Ward Richardson sums up the matter thus:

"If *all* these signs point to death . . . the evidence may be considered conclusive that death is absolute. If these leave any sign for doubt, or even if they leave no doubt, one further point of practice should be carried out. The body should be kept in a room, the temperature of which has been raised to a heat of 84° F., with moisture diffused through the air, and in this warm and moist atmosphere it should remain until distinct indications of putrefactive decomposition have set in."

Apparitions

We often hear of strange stories connected with death and the hour of death. Have such stories any foundation? Doubtless they have. The apparition of a dying person is frequently seen at the moment of his death, even thousands of miles away; or a friend may hear his name called; or some remarkable phenomenon may oc-

[1] See "Death: Its Causes and Phenomena," for a full description and criticism of all these signs of death; together with much other *data* bearing on the question.

cur—such as raps, the opening and closing of a window, etc. These cases are now too numerous to be set aside as mere "superstition." The Society for Psychical Research, of London, conducted an extensive inquiry, some years ago, into this question; and obtained answers from 30,000 persons. These answers were gathered in England, the United States, France, Germany, and other countries. On being put to the mathematical test, it was found that the coincidence with death was hundreds of times more frequent than chance could account for. The following conclusion was arrived at by Professor Sidgwick's Committee, after years of patient research: "Between deaths and apparitions of the dying persons a connection exists which is not due to chance alone. This we hold as a proved fact. The discussion of its consequences may not, perhaps, be attempted in our generation, nor exhausted in our age."

"The Great Beyond"

These are assuredly stirring words, and open up infinite possibilities of future research. Possibly the departing spirit, in leaving the body at the moment of death, is able to manifest to others at a great distance from itself. Possibly the dying in-

dividual is able to affect the mind and the senses of those absent, but near and dear to him, in spirit. Possibly other interpretations may be correct. We cannot say. All we know is that the *facts occur;* but *how* they occur is another matter. Science may be a long time in finding out the true explanation for such facts. But it is natural to suppose that, at such a time, many super-normal mental operations might take place, since so much is happening in the brain and nervous system, and the spirit is supposedly being freed from its material incasement. The flashes of memory, in drowning persons, and the visions which some experience on their death-beds seem to support this view of the facts; which, after all, is only what we should expect,—if anything survived the body. Not only are many remarkable physiological phenomena associated with death, therefore, but striking and puzzling mental and possibly spiritual phenomena are also associated with this moment—with the passage of the soul into the "great Beyond."

Has the Soul Been Photographed?

Various experiments have also been conducted of late years which are of great interest. At-

tempts have been made to photograph and to weigh the soul, on its departure from the body. The former were made in France; the latter in America. I shall very briefly describe these interesting experiments.

Dr. Baraduc—a French physician, who wrote much upon the nervous system and human vitality—determined to make a number of photographs of his wife's body after death. He took one at the moment of death, and every fifteen minutes after, for three hours. He employed specially prepared plates, and used every precaution to insure accuracy of result. In the first plates developed, three mist-like balls were seen, hovering over the body. As time went on, these separate bodies tended to coalesce, and form one spherical ball, becoming smaller and brighter in the process. Bright threads were also seen, binding these together. At the end of three hours, this "ball" was complete; the thread of light binding it to the corpse then snapped, and the "ball" was free to float into space. Subsequently, communication was established with this ball by means of automatic writing! After a time it left, and thenceforward was not seen again. I do not contend that a photograph of the soul was actually obtained on

this occasion; I merely record the facts, as vouched for by a conscientious observer. They are striking enough to warrant further investigation, at all events,—while the interest attached to the facts is very great.

The experiments in weighing the soul were performed by Dr. Duncan Macdougal—a physician of Haverhill, Mass. Six tests in all were made. The patient was placed on a bed,—and bed, patient and all were placed on a set of scales, which accurately recorded the weight. In all cases, the experiments were made with the patient's permission; they were made at the moment of death; and the patients were consumptives,—chosen because they usually lie without movement at the moment of death,—which might cause the beams of the scale to oscillate, and hence ruin the experiment.

In two cases, inconclusive results were obtained; but in four, a sudden and unaccountable loss of weight was noted, which the scale recorded. The loss was from half to three-quarters of an ounce. All possible normal channels of loss were taken into account; but none of these could in any way account for what has been observed. The results are at present inexplicable. Was the soul

weighed? That we cannot say; we can merely record the facts, and hope that the experiments may be repeated. Certainly, here is a fascinating and suggestive field for future researches in this direction.

CHAPTER VI

THE FEAR OF DEATH

It is a curious but a sad fact that no animal except man seems to be aware of the fate that is in store for him—to know that death is the inevitable destiny which awaits all living things. Inasmuch as man is so keenly sensitive to all that most concerns himself, and has so lively an imagination for the disagreeable side of the future, it seems a cruel fate that he should have the power of this foreknowledge of death all his life (little as it may trouble him, especially in youth) whilst other animals, equally mortal, are without it. "There must be," some have argued, "*something* wrong with the course of nature to allow such a state of affairs to exist." They rebel at the Providence which has so ordered things. In the old as in the young, this terror of death is often equally shared —partly, possibly, because of the physical pain and suffering which, it is imagined, surround death itself, and partly because of the uncertainty of what lies beyond. The first is a question of fact;

the second an attitude of mind, which can be overcome only by a sound and wholesome philosophy of life and death. Into both these questions I shall enter immediately. For the moment, however, I desire to discuss this question of the consciousness of the ultimate character of death, which exists only in man. Writing upon this question, Prof. A. Dastre, in his book, "Life and Death," says:

"The greatest discrepancy of this kind (of all those which exist in nature) is the knowledge of inevitable death without the instinct which makes it longed for. . . .

"Man, like all the higher animals, is subject to the law of 'lethality.' But while animals have no idea of death and are not tormented by the sentiment of their inevitable end, man knows and understands this destiny. He has with the animals the instinct of self-preservation, the instinct of life, and at the same time the knowledge and the fear of death. This contradiction, this discordance, is one of the sources of his woes. . . .

"Whether it be an accident or the regular term of the normal cycle, death always comes too soon. It surprises the man at a time when he has not yet completed his physiological evolution; hence

the aversion and the terror it inspires. 'We cannot fix our eyes on the sun or on death,' said La Rochefoucauld. The old man does not regard death with less aversion than the young man. 'He who is most like the dead dies with most regret.' Man knows that he is not getting his full measure.

The Instinct for Death

"Further, all the really natural acts are solicited by an instinct, the satisfaction of which is a need and a joy. The need of death should, therefore, appear at the end of life, just as the need of sleep appears at the end of the day. It would appear, no doubt, if the normal cycle of existence were fulfilled, and if the harmonious evolution were not always interrupted by accident. Death would then be welcomed and longed far. It would lose its horror. The instinct for death would replace at the wished-for moment the instinct of life. Man would pass from the banquet of life with no further desire. He would die without regret, 'being old and full of days,' according to the expression used in the Bible in the case of Abraham, Isaac, and Jacob."

The very fact that we do not, as a rule, witness

this instinct for death proves conclusively that death has taken place prematurely ; that life has been cut short by accident or disease. Even in the majority of so-called deaths from old age, it is usually a disease which carries them off—always, according to Dr. Regnault ! This being so, it is a plain proof that virtually all deaths are premature; and this in turn proves that the general methods of living adopted by the majority are fundamentally unsound—particularly, I am persuaded, their diet—and that much of the advice given nowadays is erroneous, and not calculated really to prolong life in the manner claimed.

Longevity can be obtained in certain ways, and in certain ways only. It cannot be reached by taking any elixir of life, any patent drug or nostrum, by resorting to transfusion, or to any similar devices. Life must be guarded and cared for, just as we would guard and care for a plant ; and the desired results will come to pass. Only by such means can old age and natural death be attained. As Feuchtersleben said : " The art of prolonging life consists in not cutting it short ; " and we cut it short by our habits, the kind of life we lead, by what we eat, drink, and breathe in particular. The laws of life followed, there can be no reason-

able doubt that death would take place only at the allotted time; and would then be craved, rather than feared; longed for rather than dreaded.

Self-preservation

The instinct of self-preservation, which is the strongest instinct in the whole organic world, means, simply, that we each one of us desire to protect our own lives from threatening danger of annihilation. It is a law which rules all living creatures, from the lowest to the highest, and however much we may trust to the future and believe in a future life, this has not in the least lessened the terrors of death, or lessened the instinct of which we have just spoken. Life is undoubtedly the most precious of all the energies; we desire life; we cling to it; we desire to prolong it as long as possible, and it is only when the natural age limit is reached that this desire gives place to another equally natural—the desire for death.[1] The search of the alchemist, during the

[1] This statement may lead to a misunderstanding. I have said that, in old age, the instinct for death takes the place of the instinct for life; yet again that, in old age, life is still craved. Is this a contradiction? No; for the reason that there are *two* kinds of old age. But because of the poverty of words in the English language, both states have to be defined as "old

Middle Ages, was for three things:—the transmutation of metals, the philosopher's stone, and the elixir of life—and men have not ceased to search for these same things, under somewhat different names, ever since! The transmutation of metals is now an accomplished fact in chemistry; men in great cities are still searching (figuratively speaking) for the philosopher's stone, which transforms all it touches into gold. And the elixir of life—do we not hear, ever so often, of some wonderful discovery in medicine, which promises something in this direction, or some routine which, if followed, would indefinitely prolong life? And when one such is announced, how men flock to procure it! This shows us how much men desire life; and how they desire to live as fully and well as possible.

And this is justified. Whether we live again or not in some future existence, certain it is that

age." Thus, we call a man of eighty "old"; he has attained old age; yet he still longs for life. When a man is 105 years of age, he is still "old,"—yet the craving for death may have taken the place of the craving for life. There is a line, a point of transition, where one state merges into the other; yet both are spoken of as "old age." It is because of this that apparent misunderstanding may arise; whereas there is no confusion, when once this is understood.

we have but one life here on this earth—unless the doctrine of reincarnation be true; and even then we do not *remember* any of our supposed former lives, so we are just as badly off as if we had never lived at all! All this shows us that the desire to live is universal; as keen in the old as in the young, as we know; and only in very rare cases is the desire for life extinguished.

Is Love of Life Justified?

The question has been asked: Is it right that this love for life should be gratified and pampered and fostered, as we pamper and foster it in our modern civilization? Is not too high a price set upon human life, making cowards of us all? Are we not all becoming so enamored of life that no more heroic deeds will soon be possible—no one will venture to sacrifice his life for the sake of another, or risk it for a glorious cause?

There is a certain amount of truth in this argument, as there is in all arguments of the kind; indeed, more than most people grant. At the same time, we must bear in mind that each individual life is not only precious to the individual who possesses it, but in all probability others are depending upon it, and, in the complex state of

our modern civilization, few lives are so isolated that they can be missed without their loss affecting more than the loser himself. And, too, individual life is generally precious; except in the very aged and infirm, the average person is a valuable factor to the state; he performs a duty which, perhaps, no other person could fill. As for the very aged, there are but few of them nowadays, in comparison to the total population; and there is every reason to suppose that, with better sanitary and hygienic conditions, these will become fewer and fewer as time goes by.

Life, then, is worth preserving and *should* be preserved, whenever possible. That is the conclusion to which we are driven by a study of the facts: and, that being so, the only question which remains is: How are we to prolong it? What measures are we to pursue in order to protract, the more effectually, a healthful and happy life? This practical side of the question has been dealt with throughout this volume.

We must now return to the two aspects of death to which we referred earlier on; *viz.*, the question of pain at the moment; and the dread of what may lie beyond the "great divide." Let us take them in turn:

Pain at the Moment of Death

This must be treated from the double standpoint of physical pain, and the mental consciousness of dying. First, as to physical pain.

By a wise provision of nature, pain is but rarely felt on this occasion—so rarely, in fact, that it might almost be said never to occur to all. Many famous physicians have testified to the fact that they have attended hundreds of death-beds, and have seen few cases—some of them not any—where consciousness was present, allowing pain to be experienced. (For one is impossible without the other.) The reason is that, as death approaches, the breathing is diminished, becoming shallower and shallower; and as this takes place, carbon dioxide accumulates within the system, which acts upon the nerve-cells as a poison, deadening their sensibility, and tending to put them to sleep. In fact, there is a natural anæsthetic, which is operative at death, and this effectually prevents, in almost all cases, the sensation of pain, which is usually lost long before death actually takes place.

In fatal diseases also (from which the majority of persons die) the poisons generated by the bacteria or the disease itself act upon the nerve-cells in much the same manner,—poisoning them and

preventing them from feeling pain. Thus, there need not be the least fear that physical suffering will be present at the moment of death. It is almost an impossibility, which is certainly a great comfort to the majority of persons.

Natural Death is Painless

As we have seen, natural death, and in fact nearly all deaths, are painless—made so by a wise provision of nature. But in some cases, and particularly in diseases of certain types, pain is experienced for a long time before death finally occurs; and it is the duty of the attending physician to deaden and neutralize this as much as possible. Various drugs, injections, etc., are resorted to on these occasions, in order to relieve the pain,—usually with success. But it will be observed that pain at this time and for this reason is no more to be dreaded than pain at any other time; it is pain of the same character, and of the same or lesser intensity.

Pain is due to many causes, one of the most frequent, I am persuaded, being the pressure upon the nerves of mal-assimilated food material, which has been retained in the tissues. Stimulation of the circulation in the parts will thus often serve to re-

move this pain. Hot water bags will be found of great service in this connection, though cold is sometimes craved. *Cold stimulates, while heat facilitates, function.* So long as pain is present, however, it is, in a certain sense, a good indication. It is a sign that the fight for life is going on. Only when pain ceases entirely has the battle ceased; the forces of death have overcome the forces of life. Cancer patients, for example, often suffer great pain until a few hours before they die, when pain leaves them. Nature has given up the fight. It is no longer of any use. Death is inevitable. There is no longer warfare; it is surrender.

Consciousness at the Moment of Death

This is almost invariably absent. It is even more rarely found than pain, which, as we have seen, is rare enough. Some physicians, indeed, take the stand that such a thing would be an impossibility, inasmuch as consciousness is being abolished at that time, and it therefore cannot be conscious of its own annihilation. It is probable, indeed, that, in the majority of cases, the mental operations have ceased long before the physiological functions are discontinued. All this being true, it is probable that, in virtually all cases, at

least, consciousness cannot be present at the moment of death ; so that *this* fear of death vanishes, together with the other.

The Fear of Being Buried Alive

Before leaving this question of the fears which surround death, I may refer to one which is certainly powerful, in some natures, and which is a cause of dread and horror, with them, for years before they actually die. I refer to the possibility of being buried alive. Certain it is that many have been buried alive in the past ; and no imaginable death could be more terrible. But such a fear need not fascinate us at the present day. While such deaths have doubtless taken place in the past (and may even now take place in certain less civilized parts of the globe) there is little fear to-day of premature burial—living, as we do, in the midst of a high civilization and scientific culture. A *combination* of the signs of death, made by a competent physician, is almost certainly correct ; there is hardly one chance in a million of its being incorrect. Single signs and tests of death are often fallible, it is true ; and many of them are antiquated and given up ; but a combination of all the signs is virtually final ; and decomposition is also an infalli-

ble sign. A careful diagnosis by a competent physician may, therefore, be relied upon—though, at the same time, the relatives should insist that this *is* performed.

The Body After Death

And now what of the body after death? This is another aspect of the question which has held the minds of thousands in horrified fascination while they yet lived. The thought of the condition of the body after death becomes a veritable "obsession" with some persons; and seems to deprive them of all sense of proportion and value. But rightly considered it need not and should not do so.

For, in the first place, if a thing is a fact, it must be endured or ignored; and nothing is to be gained, and perhaps much to be lost, by thinking of it. There are many ugly facts in nature; but we prefer to ignore them, for the most part, and turn our attention to something else. There are always minds who revel in delving into such matters; let them do so! For the rest, let us make up our minds to ignore and turn from all that is unpleasant in this connection; and the thoughts will be found to be governed, if the *will* is exercised in the right direction.

In the next place this question, like any other, can be made one of scientific interest. If our love for the departed will not allow us to think of them in this connection, we should at least be able to think of the matter in an abstract form. If this is found impossible, then it is best to drop the subject altogether—at least so far as *we* are concerned; and leave it to others who are enabled to do so without giving rise to such feelings.

Decomposition is assuredly an unpleasant topic to contemplate, but so far as it affects ourselves, we need not shudder at the thought. For, either consciousness exists after the death of the body, or it does not. If not, then assuredly such a phenomenon cannot affect us in the slightest—any more than a similar phenomena which have taken place millions of times before we were born. If, on the contrary, our consciousness *does* persist after the death of the body, we shall assuredly not be in any way conscious of, or associated with, the latter; we shall exist in another sphere, quite separate and apart from the physical body, which we shall probably have forgotten all about, in the novelty of the new environment and situation, until it is too late to affect us. From any point of

view, therefore, we need not dread death or what follows from it on this particular ground.

Cremation

Finally, it may be said that much of this would be avoided, if only the practice of *cremation* were generally instituted. Certainly, it is far more pleasant in my estimation to contemplate cremation than burial. In the one case, we have a perfectly clean and hygienic process; the result is a handful of ashes, which may be preserved in a jar, if desired. In the other case, we have an unhygienic and unsanitary process, followed by months and years of slow decay. In both cases the body is destroyed and necessarily destroyed. Nothing we can possibly do will preserve it; and in fact we should not *want* to preserve it. It is only worn-out, theological conceptions as to the resurrection of the physical body, etc., which prevent the majority of persons from seeing, at once, that this is the most satisfactory and cleanly manner of disposing of the dead. It is far more sanitary than choking the ground with masses of dead bodies; and the thought should be far more pleasing to oneself. In my estimation, cremation deprives death of half its terrors.

The Unknown

There remains the final question, previously mentioned, to which we have not yet addressed ourselves. It is the natural fear, even terror, which such a leap into the Unknown inspires. What awaits us? What lies in that great Beyond, "from which no traveler has returned to tell us of the road"? Is it annihilation? Is it peace and rest? Is it eternal punishment? Or is it the slow but sure progress upward, which we might expect from a moral and natural order of things—in which the individual soul is free to work out its own destiny and salvation?

No one can say with certainty. We can only believe. But our belief is shaped by various influences—education, environment, religious belief, scientific knowledge, etc. Truly, there are "as many religions as there are men"; and every one must in the end make his own choice. I merely make a few suggestions in this place, bearing upon the general theme of this book: *viz.*, removing the fear which many persons may have as to death and what follows after it.

Conscious Survival

1. In the first place, if annihilation were true,

it would involve no suffering, no remorse, nothing which is to be feared. Many persons contend that this is such an "awful" thought that they cannot even contemplate it calmly; and if asked *why*, they will, in nine cases out of ten, reply, "Because I cannot bear the thought of never seeing those near and dear to me again." In this, they show that they have entirely failed to grasp the true state of affairs. What they have in mind is not annihilation, but a state of full consciousness, unable to attain what it desires. They really imagine themselves conscious; and somehow unable to get at or mentally reach their dear ones—as though iron bars intervened—bars which existed forever, and through which the longing gaze must eternally be fixed. But this is not the case at all. *This* is conscious survival, not annihilation! The latter is pure nothingness; and we cannot compare it with life; because they are incapable of being compared. A better mental conception would be this: *Imagine yourself before you were born!* On trying to do so, you will probably find that a blank wall is presented to the mind—absolute nothingness. It is this which we have to imagine in the future. There is in this, as may be seen, nothing to be feared, noth-

ing to be dreaded. We cannot dread oblivion,—or we *should* not, for we experience it every night, when we go to sleep!

Eternal Rest

2. As to rest and peace eternal; if that is the true doctrine, there is assuredly nothing here to be feared. Indeed, the only wonder is that those who hold to this view, and sincerely believe it, should be so fearful of death and fight so hard to preserve life! There is assuredly a paradox here, which is not without its humorous side, rightly interpreted.

Eternal Damnation

3. As to the doctrine of eternal damnation, I shall not do more than say that at the present day the tendency is to believe it less and less. Those who continue to believe in this doctrine might with advantage read the Rev. Dr. Campbell's book, "The New Theology," which will doubtless inspire him with greater hope, and a greater confidence in the ultimate Goodness of the Universe.

Life Beyond the Grave

4. Finally, we reach the doctrine, now held by

many, that man progresses, in the next world, according to his own merits and efforts, and in proportion to the life he has lived here. According to such a theory, we progress indefinitely; fulfilling the law of evolution. Life is there very much as it is here. We grow according to our efforts. Heaven is "within ourselves," and we have only to strive in order to attain it. Assuredly *this* is nothing to be feared; nothing to be dreaded and avoided. It is rather what we should expect; and is little more than we experience here and now, every day of our lives.

Thus we are led to the conclusion that, no matter what view we may take of death, and of what follows upon it, we need not be alarmed; we need not regard it with horror or fear. The Power which brought us into this universe, and maintained us while here, is quite capable of supervising a wise control in another life, whatever its conditions may be. The *present* constituted the *future* to those who lived before us; whilst our future will only be present to those who follow after us. In this or in any other world, life is probably continuous and progressive; and as we have little to fear from the past or the present, so we need have still little to fear from the future.

Fear is a demon: "Resist the devil and he will flee from thee."

Thus we see that, instead of a decrepit old age, a happy, normal longevity may be attained, by following the laws of life, which are plainly indicated for us, did we but deign to follow the voices of nature. Old age would be natural and death would be wished for, instead of feared. I conclude in the words of Professor Dastre:

"Death, then, the 'last enemy that shall be destroyed,' to use the expression of St. Paul, will yield . . . to the power of science. Instead of being 'the King of Terrors,' it will become, after a long and healthy life, after a life exempt from morbid accidents, a natural and longed-for event, a satisfied need. Then will be realized the wish of the fabulist:

"'*I should like to leave life at this age, just as one leaves a banquet, thanking the host, and departing.*'"

CHAPTER VII

CONCLUSION

We have now reached the conclusion of our survey of the causes of old age and premature death, and it remains for us briefly to summarize them. We have seen that the majority of deaths are premature, but few attaining the old age which, modern science says, should be attained by all,—an age of at least one hundred years. Without growing prematurely old, or showing any of the signs of decrepitude and mental imbecility, we all should normally live to be at least as old as that, if not older. Inasmuch as this *is* not the case, it is evident that something is wrong with our civilization and methods of life which not only shorten life greatly, but more than cut it in halves; and even the half which remains is full of illness and diseases of various kinds, rendering life miserable and full of bodily and mental suffering. Our object should be so to live as to prevent this from occurring; and at the same time to prolong life to its normal or allotted span.

The only way in which we can do this is by fol-

lowing certain laws or rules of hygiene, which are the laws of life. The following are the most important of these rules, condensed into as few words as possible. They are fully treated in the text:

1. Do not eat much, if any, meat.

2. Eat plentifully of fruits of all kinds; make them an essential part of your diet every day.

3. Avoid all bad food combinations.

4. Fast completely one day of every month; and, whenever indisposed, omit a few meals, until natural hunger returns.

5. Eat but two meals a day, avoiding breakfast.

6. Masticate every mouthful of food thoroughly.

7. As you grow older, eat less.

8. Drink at least four glasses of water daily; and when feverish, ill, or indisposed double the number until you are well again.

9. Breathe pure air at all times, day and night, in the house or out of it; and, if indoors, see that the windows are so arranged as to give a plentiful supply of fresh air.

10. Exercise a certain amount every day, using all the muscles in turn, so that none are neglected. This should be continued until slightly fatigued.

11. Take as much sleep as you require every

night; it is worth more than food or drink to you; it is the one thing you cannot omit without danger. Always take plenty of sleep.

12. Think only helpful, cheerful, optimistic thoughts; never allow injurious or distressing thoughts to occupy the mind. "Under all circumstances keep an even mind." Fill the mind with good, clean, happy thoughts, and there will be room for none others—thoughts of premature old age, decay and death.

13. Keep happy!

14. Bathe frequently. A cold bath is a good thing if you can react from it properly; it is not, if you cannot. Take a warm bath at least twice a week, and a Turkish bath once a month.

15. Wear loose, warm clothing, which is not air-tight; and only enough to keep the body warm when the skin is active.

16. See that the predominating color around you is green, with occasional dashes of reds and brighter colors.

17. Seek a high altitude, as a rule, in which to live. A cold climate is more healthful, as a rule, than a warm or hot one.

18. Determine to create your environment; and do not be dominated by it.

19. Do not fear the effects of heredity; they are generally mythical, or at all events impotent, if a careful life be lived.

20. Never allow yourself, even subconsciously, to set a definite age limit for yourself, at which you expect to die. There is no reason why you should not live to be a hundred, or more.

21. Take your own personality and temperament as you find it, and make the most of it.

22. Amusement and distraction are legitimate, and should be indulged in, even cultivated. Have a hobby; develop an interest in life; cultivate the mind; never feel that "your life's work is finished." Any amusement is legitimate which leaves you refreshed.

These are the principal rules of health and long life which, if followed, will assuredly prolong it, and will make it also happier, healthier and more useful while it is being lived. Beside these chief or most important rules for a long life, there are others of comparatively lesser importance, but which are, nevertheless, helpful. They are:

1. Take a sun bath whenever possible.
2. Take a few minutes' air bath every day.
3. Take a salt rub once a week.
4. Attend to the individual bodily members—

the eyes, ears, hair, teeth, feet, etc., since upon them good health also depends.

These and many more minor rules will be found described in the book, and may be followed with advantage. Needless to say, all medical and sanitary arrangements should be attended to immediately; alcohol, tobacco and drugs avoided, etc. Every one should devote some time to the study of the body (physiology) and of the mind (psychology), and thus gain a general knowledge of the human machine he inhabits and unconsciously operates. A little knowledge applied in the right direction, at the right time, will save many a life, and be the means of prolonging it in many other cases. Effort spent in this direction will more than repay the student for the time, money and energy expended.

And now we have concluded our brief summary of the chief causes of old age, of the laws which, if followed, would lengthen life and postpone death. Learn them; follow them, and health and abounding happiness will be yours!

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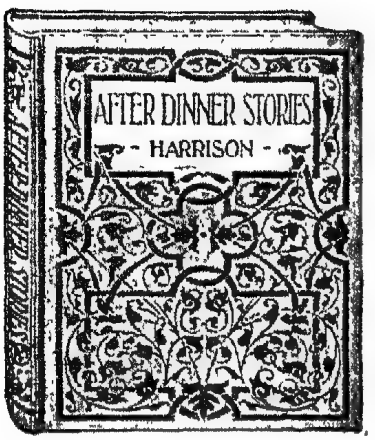
POPULAR HAND-BOOKS



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